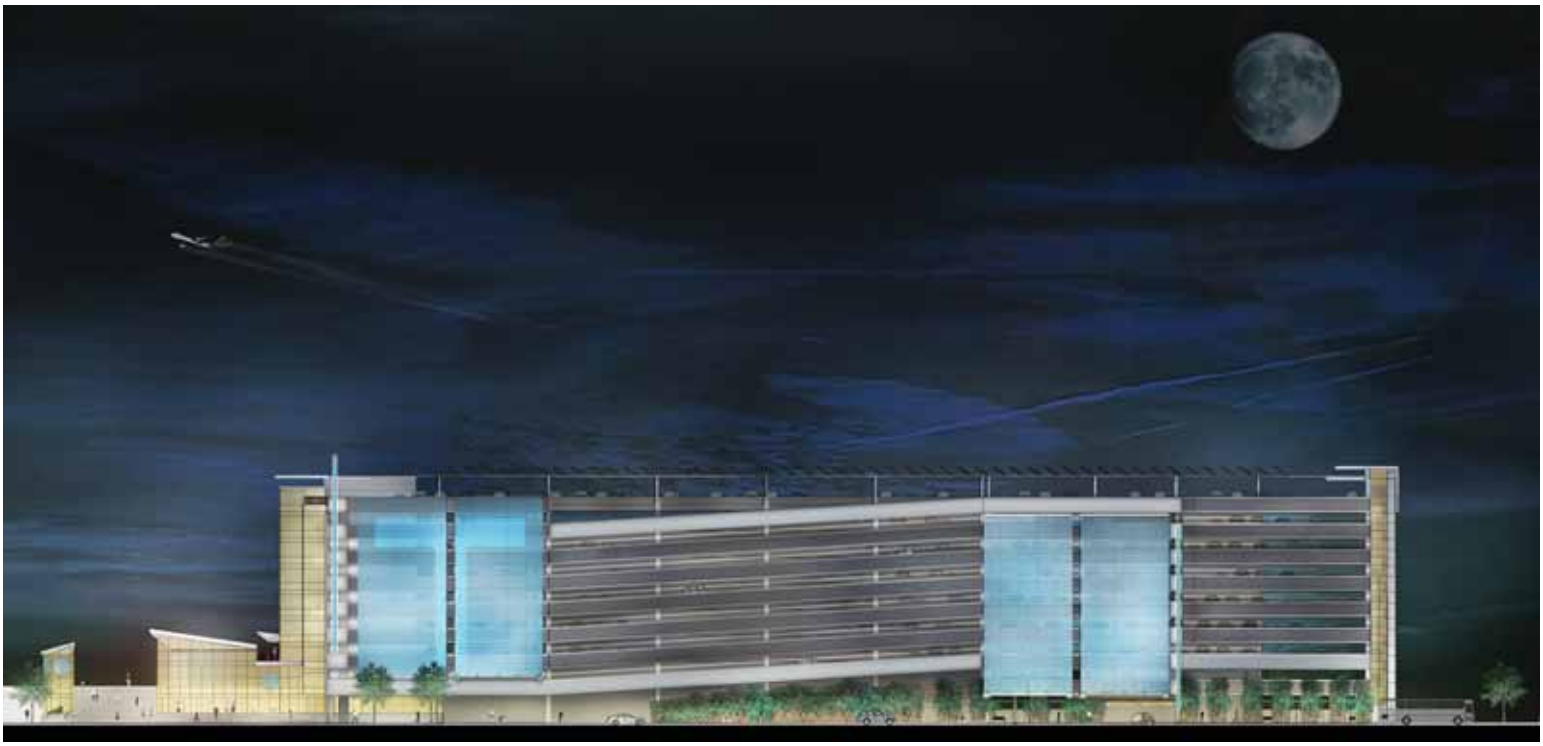
Environmental Assessment

South Garage at Wonderland Station
Revere, Massachusetts



Issued by:
U.S. Department of Transportation
Federal Transit Administration

In cooperation with:
Massachusetts Bay Transportation Authority

January 11, 2010

Epsilon
ASSOCIATES INC.

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Section 1.0

Project Description

1.0 PROJECT DESCRIPTION

The Massachusetts Bay Transportation Authority (MBTA, the Proponent) in cooperation with the Federal Transit Administration (FTA) proposes to construct a new parking garage adjacent to Wonderland Station on the MBTA's Blue Line in Revere, Massachusetts (see Figure 1-1, Aerial Locus Map). The new parking garage (the South Garage, or Project) will provide approximately 1,963 parking spaces along with additional elements designed to create a multimodal transit facility integrated with the adjacent Wonderland Station. As such, the purpose of the Project is to consolidate parking into a single area providing safe and efficient parking capacity to optimize MBTA services and integrate them with adjacent roadway functions; the parking supply in the garage will ensure sufficient commuter parking despite the loss of existing surface parking areas that are planned for development as part of a separate project. While the South Garage Project will facilitate this important development, it has an independent utility by ensuring that MBTA customers are provided a sufficient parking supply even as non-MBTA-controlled surface parking is eliminated.

Specifically, the Project elements include the following:

- Approximately 1,963 MBTA-owned structured parking spaces; approximately 600 of which will be leased to the City of Revere to support its redevelopment efforts;
- A new entrance, elevators, and other associated accessibility improvements and connections to Wonderland Station, the terminus of the MBTA Blue Line subway;
- Improved and expanded handicapped-accessible parking, which will comply with ADA standards;
- A flood storage area on a nearby MBTA-owned parcel to compensate for the floodplain volume that will be occupied by the South Garage;
- Secure, covered bicycle storage within the South Garage; and
- A covered and sheltered waiting area for bus patrons.

Each of these elements is associated with the vertical parking structure, which is the subject of this Environmental Assessment (EA). Additional ground-level features involving a busway and kiss-and-ride area will be constructed on site as part of a separate project approved in a Categorical Exclusion (CE) dated September 7, 2007 and an Environmental Re-evaluation dated June 4, 2009 (see Section 1.2 for additional information). See Figure 1-2 (Ground Floor Plan) for a graphical distinction between the Project and the features approved in the CE. Figures 1-3 through 1-5 illustrate the remaining floor plans for the South Garage Project.

As depicted on Figures 1-6 (Existing Parking Supply) and 1-7 (Post-Construction Parking Supply), the Project will increase the overall supply of MBTA owned commuter parking in the Project vicinity from 1,273 spaces to 2,485. In addition to these MBTA owned spaces are privately owned and operated parking adjacent to Wonderland Station as well as private spaces at the Wonderland Dog Track currently used for commuter parking west of the Project site. These privately owned spaces are not included in this total, but are considered as part of the No Build condition in the environmental and traffic analysis. The EA also assumes the elimination of the existing spaces on the MBTA-owned Parcel H property; although the South Garage Project will not affect parking on Parcel H, that site is proposed for development as part of a separate project by a private developer, and therefore was not included. Existing and proposed MBTA parking space totals are provided in Table 1-1.

Table 1-1 Existing and Proposed MBTA Parking

	Existing	Proposed	Increment
MBTA South Lot/South Garage Site	424	1963	1539
MBTA North Lot	569	522	-47
MBTA Parcel H	280	0	-280
Total MBTA Owned Parking	**1273**	**2485**	**1212**
Parking to be Leased to City of Revere	--	600	600
TOTAL NEW SPACES AVAILABLE FOR TRANSIT	**1273**	**1885**	**612**

MBTA customers will have ongoing access to sufficient parking throughout construction, as explained in greater detail in the Construction Management Plan provided in Section 4.14.2. Furthermore, construction will not result in the shutdown of MBTA service; although minor operational modifications may be necessary to accommodate certain stages of construction, disruptions will be minimized to the extent practicable.

As detailed herein, the Project design avoids or minimizes potential impacts to the extent practicable, and the Proponent will mitigate unavoidable impacts. There are no significant environmental impacts associated with the proposed South Garage. Therefore, the Proponent anticipates that the Project will receive a Finding of No Significant Impact (FONSI), allowing the South Garage to proceed on schedule without preparation of an Environmental Impact Statement (EIS).

1.1 Purpose and Need

The purpose of this Project is to create a multimodal transit facility integrated with the adjacent Wonderland Station and previously-approved roadway improvements to satisfy the region's current and projected transit needs. The need for the South Garage stems from the existing demand for additional parking, the planned displacement of existing surface parking, and the lack of intermodal services at the site.

The MBTA has long recognized the need to improve commuter parking and associated transportation services to meet current and anticipated public transit demands. Existing MBTA-controlled parking facilities combined with parking at adjacent facilities (e.g., Wonderland Dog Track) collectively accommodate 3,737 vehicles (see Figure 1-6). This existing parking supply does not meet current demands; weekday utilization exceeds 99 percent occupancy according to parking counts reported in October 2006 as part of the Mid-North Shore Regional Sub-regional Transportation Study, and the MBTA trip planner website reports less than a 1 percent weekday vacancy rate for parking at Wonderland Station.

Through this project, the MBTA seeks to own and control a sufficient level of parking to meet customer demand wherever possible, especially at this critical location in the transit system. The Central Transportation Planning Staff (CTPS) recently completed systemwide parking demand projections for the entire MBTA service area.a In that report, ridership demands as well as parking projections were made for each park and ride facility in the MBTA system. Parking as well as ridership projections were made for the year 2030. According to this CTPS report, the average weekday parking demand (unconstrained) in the year 2030 is 3,050.b The MBTA will not own and control sufficient parking to meet all of the parking demand and will have to rely on off-site private parking. With the new garage in place, it will be able to supply 81% of demand; without the new garage, the MBTA would only be able to supply 42% of the parking demand. The MBTA feels strongly that it is important that it own and control as much parking as possible at a terminal critical end of the line station such as Wonderland.

The MBTA, in preparing the project's finance and operation plans, has been in discussion with the City regarding the lease of up to 600 spaces within the South Garage to the City of Revere that will be utilized by the City to support its redevelopment efforts. These parking spaces would be leased to the City at the current market rate and would generate additional revenue streams that will ensure the financial viability of the Garage. The City of Revere intends to enter into an agreement with the redeveloper to lease the 600 spaces in

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[a] *Projections of Parking Demand, Kiss-and-Ride Passengers and Ridership for MBTA Commuter Boat, Express Bus, Commuter Rail and Rapid Transit Services* prepared by CTPS, December 2008.

[b] *Ibid,* Table 6

conjunction with the build-out of the Waterfront Square development. The revenue stream that will result from the City's lease of parking spaces will be an important revenue security enhancement for the MBTA's operating and debt service costs. Given the MBTA's our current financial situation the MBTA would not be able to afford this project without the 600 leased parking spaces. The MBTA Blue Line service capacity has increased as well, with six-car service introduced in September 2008; all Blue Line trains are now six-car trains, with peak-period service consisting of 13 six-car trains. These improvements provide additional inducement for North Shore drivers to use public transit but exacerbate the existing parking shortage. As the terminus of the MBTA Blue Line, the site plays a critical role in establishing connections to other MBTA services, thereby promoting greater ridership system-wide. The proposed South Garage will serve bus and subway customers as a gateway to public transit and will also improve access to the nearby Revere Beach Reservation and other local attractions, a critical step in an overall transit-oriented development plan envisioned for the area. The South Garage is a key piece of infrastructure to support community livability. Post-construction parking available for commuters and visitors is illustrated on Figure 1-7.

The busy Wonderland Station is also in need of improved vehicular flow patterns to more safely accommodate users. According to MBTA Police, there have been two traffic accidents reported on MBTA property at Wonderland Station in the first four months of 2009. Wonderland Station is located off Route 1A, a congested roadway that provides a less-than-optimal level of service and is the location of a disproportionately large number of motor vehicle crashes resulting from deficient roadway geometry and constrained operating conditions. By facilitating greater use of public transit, the South Garage will benefit the regional highway and transit systems. The garage and associated access improvements will reduce vehicle queuing at Butler Circle and, according to the Project's Traffic Study provided in Section 4.3.2, improve traffic flow from Level of Service F to Level of Service C or better during the peak periods. Safety will improve for all roadway users. Reduced traffic from Route 1A is projected to ease conditions at Bell (Mahoney) Circle, located almost one-half mile southwest of Wonderland Station; Bell Circle is at the intersection of Routes 1A, 16, and 60 and has been identified as one of the most congested and crash-prone intersections in the Boston MPO area.[c]

The Project will also address additional safety concerns. The most pressing issues are associated with pedestrian safety at Route 1A crossings, the internal movements of vehicles and pedestrians within Wonderland Station, and deficiencies related to the existing signalized access to Wonderland Station from Route 1A and the associated roadway and intersection geometry along the Route 1A corridor. In addition, the existing handicapped-designated parking at Wonderland Station does not have spaces dedicated to vans, and

[c] This was a conclusion by the Central Transportation Planning Staff of the Boston Region Metropolitan Planning Organization in the *2004 Congestion Management System Report, Mobility in the Boston Region Existing Conditions and Next Steps.*

some spaces are more than 100 feet from the ramp entrance to Wonderland Station, requiring handicapped individuals to navigate through the parking lot and existing traffic lanes before reaching the entrance to Wonderland Station.

The Project will improve safety on the site and at the intersection with Route 1A for buses, automobiles, and pedestrians. Greater visibility and walkway and street upgrades will make travel safer for vehicles and pedestrians alike. Appropriate lighting and signage will be installed to enhance safety not only in the Garage but also along the approaches to and from the Station and to the MBTA bus berths. In addition, the proposed facility will be handicapped-accessible. The South Garage will be equipped with state-of-the-art surveillance security systems and will be part of the MBTA's ongoing security analysis program.

During construction, care will be taken to comply with applicable regulations and to guarantee the safety of workers, pedestrians, automobile travelers, and subway and bus patrons. See Section 2.2 (Preferred Alternative) for a detailed discussion of how the South Garage Project will satisfy the needs identified herein.

1.2 Existing Conditions

Under existing conditions, the Project area consists of MBTA surface parking lots (see Figure 1-1[d]). The existing infrastructure on the west side of Wonderland Station along Route 1A is aging; the asphalt parking surface is pocked with occasional pot holes, and striping for parking spaces and pedestrian crosswalks is faded. Handicapped parking is inadequate and exposed to weather, and it requires handicapped individuals to navigate behind parked cars to access the entrance ramp to Wonderland Station. Walkways on the Project site are in need of resurfacing. There is no clearly-delineated or direct path for customers to follow to Wonderland Station, and at night customers must walk through unlit, poorly-marked parking lots. Existing bicycle storage is minimal and unprotected from the weather.

Construction of the South Garage is a critical step in the City of Revere's twenty-year planning effort to transform the area surrounding the Station from a bleak heat island into a thriving commercial and residential mixed-use community capitalizing on transit access at Wonderland Station and proximity to Revere Beach. The suitability of the selected site for this Project is further enhanced by the fact that a relocated MBTA busway and new kiss-and-ride drop-off and pick-up area for MBTA riders will also be located on the property. These features were approved as part of a CE dated September 7, 2007 and an Environmental Re-evaluation dated June 4, 2009, and will be located on the ground level of the South Garage. Improvements to Route 1A and Butler Circle were also approved as part of the CE and Environmental Re-evaluation with support from the Massachusetts Highway Department

[d] Figure 1-1 shows a boundary around the MBTA-owned South Garage Project site and adjacent MBTA-owned North Lot, which is currently used for surface parking and is the area where compensatory flood storage is proposed.

(MassHighway) to address long-standing capacity constraints and safety concerns. Consolidating bus, subway, and customer services in a centralized location that will be sheltered by the proposed South Garage will provide safer, more efficient, and more accessible transfers between service modes.

1.3 Funding and Document Purpose

Through the FTA, the Federal government will contribute funding toward the construction of the MBTA South Garage, which will be adjacent to Wonderland Station on the MBTA's Blue Line. Since the Project will receive these federal funds, the MBTA in cooperation with the FTA has prepared this EA pursuant to the National Environmental Policy Act (NEPA) and accompanying regulations (40 CFR 1500); this EA has also been prepared pursuant to FTA procedures for complying with NEPA as set forth in 23 CFR 771 and 23 CFR 774. In accordance with 40 CFR 1508.9, this EA is intended to be a relatively brief public document disclosing Project details and potential impacts to facilitate discussion and informed agency action and thereby fulfill the FTA's responsibility to consider the environment in its decisions. As stipulated by 40 CFR 1508.9(b), this EA discusses alternatives, potential environmental impacts, and the Proponent's consultations with various agencies. The Project is included in the state's Transportation Improvement Program (TIP) as well as the long-range Regional Transportation Plan.

1.4 Community Outreach and Agency Coordination

The City of Revere prepared an economic development plan and Master Design Guidelines for a twenty-acre area at Wonderland Station that includes the Project site and establishes an overarching development framework for the area. A parking garage is explicitly a part of the plan, and thus the vision for the Project site is part of the City's Community Development Strategy, which establishes the importance of redeveloping the area surrounding Wonderland Station. The City has been engaged in a long-term planning effort which has included community charrettes and regular review by the legislatively-created Revere Beach Design Review Board (RBDRB). The lengthy planning process has involved residents as well as local, regional, and state officials. The Project has broad public support and is consistent with the Commonwealth of Massachusetts' Sustainable Development principles.

The South Garage is a critical facet in the plan to encourage economically-viable, environmentally-sensitive, and well-planned development in the area to capitalize on the adjacency to Wonderland Station and Revere Beach, the latter of which is a National Historic Landmark (see Section 4.11). Due to the importance of the Project area for the community and because, as described in Sections 1.5 and 3.0, there is a development plan in place for a larger area that encompasses the Project site, coordination among the Project team, City of Revere, state agencies, and developers of the adjacent proposed project has been exemplary. The proposed South Garage design is a direct product of this coordination. The MBTA has also coordinated with the Massachusetts Executive Office of

Energy and Environmental Affairs, Massachusetts Department of Conservation and Recreation, Massachusetts Historical Commission, Massachusetts Executive Office of Housing and Economic Development, and United States Environmental Protection Agency Region I, which have all favorably reviewed the Project.

1.5 Coordination with the Waterfront Square at Revere Beach Project

The South Garage is a stand-alone effort by the MBTA in cooperation with FTA, but the MBTA has also been engaged in coordinated efforts with Eurovest Development, LLC, the proponent of an adjacent proposed project known as Waterfront Square at Revere Beach. Given the site layout and geographic proximity of the two projects, this coordination is essential to ensure uninterrupted MBTA operations and the efficiency and functionality of construction schedules, and to accommodate potential future MBTA service expansions. Project construction will occur prior to construction of the Waterfront Square redevelopment, and this sequencing will avoid disruptions to MBTA operations, ensure improved public transit services are available in advance of the adjacent redevelopment, and realize construction efficiencies by making space available for the Waterfront Square project to proceed.

Section 2.0

Alternatives

2.0 ALTERNATIVES

In accordance with Section 102(2)(E) of the NEPA (42 USC § 4332(2)(E)), a Federal agency may proceed with an action only after studying potential alternatives which could likely alleviate a significant portion of a project's potential environmental impacts. Case law has established that potential alternatives do not require an exhaustive review on par with the preferred alternative, but the alternatives analysis must be detailed enough to facilitate reasoned decisions on the part of the agency. This section provides a detailed description of a "No Build" alternative and the preferred alternative. The narrative also briefly touches upon other alternatives involving (1) alternative sites, (2) a smaller parking garage, and (3) a larger parking garage.

2.1 No-Build Alternative

Under the No-Build alternative, existing conditions on the site would persist. Not only would this alternative fail to rectify the existing parking shortage for MBTA operations, but current inadequacies such as unsatisfactory handicapped-designated parking, deteriorating pavement, and insufficient signage and markings for vehicles and pedestrians would also remain. Continuing the status quo on the Project site would inhibit implementation of the City's economic development plan either by rendering the site and adjacent parcels undevelopable, since the existing surface parking lots would still be necessary, or, if other separate development proposals proceed, by exacerbating the existing parking shortage through the loss of adjacent non-MBTA-controlled surface parking.

Since the No-Build alternative would leave pedestrian and vehicular flow patterns unchanged, the Project's numerous benefits would not be realized. Congested traffic conditions would not be alleviated, pedestrian accommodations would not be enhanced, and some safety concerns would remain. Furthermore, the Project-related benefits from improved public access to transit opportunities, reduced congestion, reduction of air emissions with increased transit utilization, activation of the area adjacent to Revere Beach, and incentives for alternative modes of transportation such as bicycling and ridesharing would remain unrealized.

Finally, under the No-Build alternative, the Project site would not benefit from plans to improve water quality through enhanced stormwater management using Best Management Practices that will incorporate Low Impact Design measures (see Section 4.5).

From the explanation provided above, it is clear that there would be negative social, economic, environmental, and recreational implications of maintaining the status quo. Nonetheless, the No Build alternative is presented as a base against which all other alternatives are compared.

2.2 Preferred Alternative

The preferred alternative consolidates the majority of commuter activities on the South Garage site, enhancing the efficiency and functionality of the associated services. The ground floor of the approximately 1,963-space South Garage will include the previously-approved MBTA busway and kiss-and-ride drop-off/pick-up area so that bus, train, and customer services can occur in one central location (see Figure 1-1, Aerial Locus Map). Safe, efficient, and accessible transfers between service modes are critical elements for a Project intended to encourage transit ridership and enhance public transportation. The parking structure, related intersections, and approved busway on the ground floor will incorporate intelligent or "smart" design. Post-construction access to Wonderland Station is illustrated in Figure 2-1 (Post-Construction Access to Wonderland Station) and Figure 2-2 (Station Building Section). Recent upgrades in revenue control technologies utilized by MBTA passengers will be included in the garage as well, allowing for seamless revenue control. The South Garage is a transit-related project that is entirely consistent with previously-approved multi-modal transportation improvements (e.g., the busway and roadway improvements approved as part of the Categorical Exclusion discussed in Section 1.2). New parking provided within the South Garage will replace existing MBTA surface lots and will be accompanied by clearly-designated pedestrian walkways.

2.2.1 Parking Garage

The proposed nine-story, approximately 1,963-space South Garage will occupy a footprint of approximately 82,000 square feet that will replace existing surface parking at the Wonderland Station adjacent to Route 1A at the south end of the Station property (see Figure 2-3, Elevation Renderings). The South Garage will place commuter parking closer to Wonderland Station itself and will increase the amount of parking under MBTA management and control (see Figures 1-6 and 1-7).

The South Garage is composed of three major components: (1) the vertical core and train station lobby, (2) the double-height (approximately 22 feet high) open-air enclosure around the approved ground-level busway that will shelter that feature, and (3) the parking levels. By utilizing the double-height design at the busway, vehicle exhaust can be managed through natural ventilation. Furthermore, the additional clearance will allow for penetration of daylight, creating a bright environment that will enhance daytime pedestrian and vehicle visibility while minimizing the need for additional daytime lighting. Lighting controls have been incorporated into the design, with sensors lowering perimeter lighting during daytime hours when natural lighting will be adequate. Exterior lighting will be controlled by photocell, further reducing energy use.

Figures 1-2 through 1-5 are plans showing the layout of each floor of the proposed South Garage structure. The MBTA South Garage design includes a roof-mounted 20,000-square-foot Photo-Voltaic (PV) array that is expected to generate 200 KW of power as well as provide cover for parked cars and create visual interest from higher vantage points in the

surrounding area (see Figure 2-4, South Garage Rendering). The Project is also planning to incorporate rainwater harvesting from rooftop areas, with water storage in on-site cisterns for reuse in the busway, garage, and Station platform wash-down areas. Parking areas will be equipped with infrastructure suitable for recharging electric vehicles. By incorporating high-quality materials (many of them locally-produced and/or containing recycled content) and considering environmental sustainability, the design for the South Garage will illustrate the MBTA's commitment to environmental responsibility.

Vehicular access to the South Garage will be provided through a signalized intersection with Route 1A, which will be constructed in conjunction with the Route 1A improvements being completed as part of a separate project approved through a Categorical Exclusion (CE) dated September 7, 2007 and discussed in Section 1.2. As a result of those approved improvements, southbound left-turn ingress movements into the South Garage will be possible. In addition, a traffic signal system installed internal to Wonderland Station at the intersection of the busway with the South Garage exit will control egress from the Project in a manner that will provide buses with priority egress and thus optimize the efficiency of MBTA services.

To further enhance the appeal of public transit, the Project includes improvements to pedestrian and bicycle access at the Station. Existing pedestrian walkways and markings are in poor condition; the Project involves upgrading pedestrian pathways and markings as well as separating pedestrian paths from vehicular travel lanes. The South Garage structure will provide 120 sheltered bicycle parking spaces, thereby strengthening regional bicycling connections with the planned Bike to the Sea Route, which recently received funding for construction of key segments, and recent DCR bicycle improvements at the Revere Beach Reservation.

The South Garage will also address many of the existing safety concerns associated with Wonderland Station:

- Pedestrian safety will be enhanced with an updated crosswalk, new signalization with pedestrian phasing, and a designated pedestrian pathway through and adjacent to the existing Wonderland Station parking area.

- Handicapped-accessible parking will be improved, with spaces for cars and vans on all levels adjacent to elevators.

  A modern video surveillance system and enhanced patrols will secure the site; the security system will include digital pan, tilt, and zoom-equipped cameras at all parking levels as well as the busway, with fixed cameras monitoring elevator lobbies, stairwells, and elevator cabs. Cameras will be monitored via a centrally-controlled communication room connected with MBTA security. Improved lighting

and consolidated activity will also lessen the isolation of Wonderland Station, strengthening the sense of "defensible space" by enhancing visibility and increasing the density of people in the area.

- The South Garage will provide secure, covered bicycle parking to protect customers' bicycles from theft and exposure to rain and snow.

- Updated internal traffic signalization, lane markings, and signage will manage traffic flow from the South Garage within the site and decrease the potential occurrence of motor vehicle collisions.

Numerous additional benefits from the Project are listed below:

- Centralized access to intermodal transportation in one consolidated location;

- Universal and improved access for bus and rail passengers (see Figure 2-1);

- Safer access to public transit service with a well-lit, efficient operations center;

- Improved regional traffic movements;

- Enhanced pedestrian connectivity and shorter commuter paths of travel;

- Seamless integration with the approved Route 1A improvements, which will reduce traffic by up to 236 vehicles during peak commuting hours within Butler Circle by creating direct access to Wonderland Station from Route 1A southbound;

- Shelter from the elements for transit passengers using the approved ground-level busway; and

- Shorter travel times for buses as a result of incorporating the approved busway into the South Garage with enhanced circulation, access, and automated signals.

2.2.2 Integration with Bus Service

The relocated busway and new kiss-and-ride area that were previously approved as part of a CE (see Section 1.2) are located on the ground plane of the Project site and will be incorporated into the ground level of the South Garage, with access provided directly from Butler Circle (see Figure 1-2). Relocating the approved busway to the west side of Wonderland Station and incorporating it into the ground floor of the proposed Garage will consolidate bus, Blue Line, and customer services in a central location to provide safer, more efficient, and more accessible transfers between service modes (see Figures 2-2 and 2-3). Consolidating bus activity within the Station and busway area will also improve safety on Route 1A and enhance customer convenience. Commuters using the approved kiss-and-ride will have cover from the elements and direct access to Wonderland Station.

The approved busway will be a double-height space (approximately 22 vertical feet) with a metal and glass canopy protecting the seating areas. A mesh windscreen will back up to the MBTA Blue Line tracks to provide bus patrons with shelter from wind off the ocean and noise from the trains. The reconfigured and improved busway will have the capacity to accommodate six parallel-parked buses and will be equipped with a concrete platform, pedestrian shelters, trash receptacles, and appropriate lighting. For additional operational flexibility, the MBTA may also use the bus circulation loop for storing buses overnight or for staging emergency busing operations during a Blue Line service outage, should one occur.

2.2.3 Land Transfers

Certain changes in the configuration and traffic control characteristics of Route 1A adjacent to existing MBTA parking will be necessary to accommodate the approved busway relocation and construction of the South Garage above the busway with access from Butler Circle. Route 1A is a state highway layout owned and controlled by MassHighway. Proposed changes to the configuration of the state highway layout for Route 1A include a new right-turn-only lane at the existing entrance into the MBTA South Lot, which is the proposed South Garage site. To accommodate the configuration change, land transfers from the MBTA to MassHighway will be required as shown on Figure 2-5 (Taking for State Highway Layout).

2.3 Alternative Project Sites

In considering where the proposed parking garage might be located, the MBTA evaluated publicly- and privately-owned land in the vicinity of Wonderland Station. Project siting considerations included requirements pertaining to the necessary parcel size, proximity to Wonderland Station, pedestrian accommodation, and bus and automobile accessibility. This siting review led to a decision to use the proposed MBTA-owned land, requiring only the MassHighway land transfer mentioned immediately above. Using the proposed site avoids the need for the MBTA to acquire other costly property for the Project and prevents the potential development of a currently undeveloped site. The only privately-owned site that could accommodate a 1,963-car parking structure is located on the west side of Route 1A, where such a facility would require MBTA passengers to cross a busy four-lane vehicular roadway to access Wonderland Station. Moreover, that private property is not known to be for sale, and efforts to acquire it would be costly and time-consuming. Other than the proposed Project site, the only publicly-owned property near Wonderland Station that is not part of a public park or other protected land is on the east side of Wonderland Station along Ocean Avenue; the City of Revere and the Massachusetts General Court have designated this property for redevelopment, however, and the land is not available for MBTA parking.

The preferred alternative also keeps Wonderland Station parking close to its current location, minimizing potential disruptions to commuting patterns and the potential loss of transit ridership that could result from a more significant change in location. The adjacency

of the proposed garage to Wonderland Station provides a safe, continuous pedestrian pathway linking pedestrian, bicycle, private auto, and bus modes to the Blue Line rapid transit mode. Lastly, the proposed Project site consists of paved surface parking lots and does not contain environmentally-sensitive resources. As a result, it is rational to forego performing a comprehensive alternatives analysis based on environmental constraints.

2.4 Smaller Parking Garage Alternative

A smaller parking garage would not meet the needs for this Project that are described in Section 1.1. There is an existing shortage of MBTA-controlled commuter parking at Wonderland Station, and this shortage is expected to worsen as ridership increases in response to expanding Blue Line capacity and rising gasoline costs; in addition, adjacent existing non-MBTA-controlled surface parking is proposed to be displaced by other, separate development. Encouraging greater reliance on public transit is a high priority for the Commonwealth, which is devoting significant resources to reducing greenhouse gas emissions. A parking garage that is smaller than the structure proposed in this Project would be inconsistent with reaching that goal.

2.5 Larger Parking Garage Alternative

The South Garage is designed to satisfy projected parking demand in 2030[1], and the MBTA has not determined that a larger, and consequently more expensive, parking garage will be necessary to accommodate anticipated needs. The proposed parking garage fits safely onto the Project site, provides sufficient parking capacity, and is consistent with the fabric of the City's development program.

A parking facility of larger capacity is not feasible in the proposed location due to site constraints. The roadway configuration surrounding the proposed garage allows for a single multi-lane entry/exit point. Analyses of the traffic flow and commuter demands have indicated that this single entry/exit point would not be able to accommodate a significantly greater traffic flow. Furthermore, due to the size of the site any increase in parking capacity would require the construction of additional parking levels, increasing the height of the proposed structure and impacting both the level of service and the neighborhood. The proposed South Garage height is approximately 100 feet, which is in conformance with City of Revere zoning standards and compatible with nearby buildings along Ocean Avenue and Route 1A. A larger parking structure would potentially exceed zoning standards (i.e., 140 feet for an RC-2 zoning district) and conflict with the existing community character.

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[1] Massachusetts Bay Transportation Authority, Central Transportation Planning Staff. 2008. *Projections of Parking Demand, Kiss-and-Ride Passengers, and Ridership for MBTA Commuter Boat, Express Bus, Commuter Rail, and Rapid Transit Services*. Principal Authors: Sanjay Kaul and David Krusé. December.

2.6 Other Alternatives Considered

In 2000, the *Lower North Shore Transportation Improvement Study* by Central Transportation Planning Staff of the Boston Metropolitan Planning Organization offered four alternatives to the shortage of parking and related roadway congestion in the vicinity of Wonderland Station: (1) better use of the Lynn Garage; (2) existing Express Bus Service; (3) new remote parking lots; and (4) an extension of the Blue Line to Lynn and Beverly. Provided below is a brief assessment of these four alternatives.

1. Better use of the Lynn Garage: At the time of this recommendation, commuter rail lots in Swampscott, Salem, and Beverly were all full; this remains the case in 2009. Wonderland Station parking is also fully utilized, which is a testament to the level of demand for Blue Line service. The Lynn Garage, which is located on the commuter rail, does not appear to be as desirable from a customer's perspective since the garage remains underutilized; one-third of the parking demand at Wonderland Station comes from Lynn. Therefore, although this alternative may be desirable, transit users appear to favor the less expensive, more convenient travel provided by the Blue Line.

2. Existing Express Bus Service: As noted by CTPS, historic low utilization of express bus service indicates that passengers do not perceive it as comparable to the Blue Line. This perception remains unchanged today, as evidenced by the high demand for parking at Wonderland Station. Moreover, possible cuts in express bus service due to financial considerations mean that express bus service is not a viable long-term alternative for reducing Blue Line demand, and therefore the need for expanded parking capacity at Wonderland Station remains.

3. Additional New Remote Parking Lots: Existing park-and-ride lots are underutilized because they do not conveniently connect with transit and the Blue Line. Even with the recent expansion of the park-and-ride lot network, the parking capacity at Wonderland Station remains fully utilized.

4. Extend the Blue Line to Lynn and Beverly: The South Garage Project does not preclude a potential Blue Line extension in the future. However, the Project addresses an immediate need whereas any Blue Line extension would undergo years of planning and permitting before being realized.

Section 3.0

Consistency with Local, Regional, and State Plans

3.0 CONSISTENCY WITH LOCAL, REGIONAL, AND STATE PLANS

The Project is designed to be consistent with local and regional planning objectives, particularly the Revere Beach Master Plan and resulting Transit-Oriented Development (TOD) Plan and Design Guidelines issued by the City of Revere. The South Garage and associated access improvements are within one of sixteen state-designated Growth Districts, and the City of Revere is a state-designated Gateway City, meaning that it is an area of social need and a recipient of a heightened focus on development and enhanced opportunities. Transportation improvements associated with the South Garage are included in the Metropolitan Area Planning Commission's (MAPC) Metro Plan 2000, Metro Futures, and the MAPC Comprehensive Economic Development Strategy (CEDS). The Project also promotes the Commonwealth's Sustainable Development Principles and is consistent with existing state, regional, and local economic development priorities.

The South Garage Project addresses the system-wide need for additional parking per the State Implementation Plan (SIP). As such, the Project is a critical element for fulfilling an existing need and a legal mandate. Specifically, the South Garage Project will assist the Massachusetts Executive Office of Transportation (EOT) with its plans to fulfill its SIP requirement to provide 1,000 park-and-ride spaces at MBTA stations within the Boston metropolitan planning area on or before December 31, 2011. In EOT's July 2008 status report on transit commitments, Wonderland Station is identified as the location for at least 100 additional parking spaces to help EOT fulfill its SIP commitments and reduce air emissions. Since the July 2008 status report, the South Garage Project has been designed and favorably reviewed and has secured state environmental permits and certificates. Thus, the South Garage is not only consistent with state transportation plans, but it also fulfills legal commitments to improve air quality and the environment.

3.1 DCR Master Plan

Work on the Master Plan for DCR parkland south of Revere Street to Ocean Avenue was already underway when design of the South Garage began. The Project team reviewed the draft Master Plan and continues to work with DCR to coordinate relevant programming and design elements prior to finalization of the Master Plan.

3.2 Revere Beach Boulevard

Implementation of the DCR Plan for Street and Landscaping Improvements from Revere Street north to Carey Circle is almost complete. The South Garage plans are consistent with the DCR Master Plan, including street tree planting and lighting plans.

3.3 Revere Beach TOD Plan and Design Guidelines

The Project will recognize the full potential of the selected site by developing an important multi-modal transportation facility immediately adjacent to Wonderland Station and Revere Beach. As such, the Project is consistent with the goals and objectives set forth in the City

of Revere's February 2006 Request for Proposals and Definitive Development Plans, as well as the Design Guidelines. The Project also fulfills the City's long-standing goal to initiate economic development in this urban area.

In addition to improving parking services, the Project will improve public infrastructure by reconfiguring entrances to Wonderland Station and will improve transit efficiency by relocating bus and commuter traffic from neighborhood streets to Route 1A (a primary arterial roadway). Landscaping and streetscape enhancements will be functional as well as aesthetically pleasing.

3.4 Metropolitan Area Planning Commission

The Project is consistent with and furthers the goals of MetroPlan 2000 and MetroFuture, the regional plans developed by MAPC. MetroPlan provides a vision for concentrating future growth in the 101 cities and towns of the MAPC; as of May 28, 2008, MetroFuture has been the regional smart growth plan for the Metro Boston area. The Commission's planning objectives include regional connectivity and expanded housing options, both of which will be supported by the Project's general transit improvements and enhanced access to an underutilized coastal area that is home to the first public beach in the United States. Consistent between the two plans is the basic premise that concentrated development is more economically and environmentally sustainable than scattered growth. Well-planned, concentrated development encourages and enhances transit use, ride-sharing, and pedestrian opportunities, collectively reducing auto travel and the resultant traffic congestion, air pollution, and fuel consumption. Efficient land use can also reduce the pressure to develop open space and other environmentally-sensitive areas.

The Project will provide efficient and well-planned parking to support and encourage public transit use as well as create a direct connection to the coastal area. Creating an efficient multi-modal facility by incorporating the approved busway reconfiguration and kiss-and-ride into the ground level of the Garage will enhance the functionality of public transit at Wonderland Station, thus promoting ridership. The Project involves redeveloping an existing urban site and promoting public transit as well as pedestrian and bicycle uses, and will not adversely impact open space.

The Project is included as part of the Comprehensive Economic Development Strategy for the U.S. Economic Development Administration's designated economic development district for metropolitan Boston, which is staffed by MAPC. Through its numerous benefits and by creating opportunities in areas of high unemployment and pockets of poverty, the Project furthers the CEDS Economic Development goals. In fact, the South Garage Project, by expanding parking capacity and consolidating surface parking into a vertical structure, is a critical component for leveraging new private investment in the area. The benefits and improvements from the South Garage Project will make it possible to redevelop property

located on the east side of Wonderland Station (this redevelopment will be a project known as Waterfront Square). This relationship highlights the linkages between land use, economic development, and transportation.

3.5 Boston Metropolitan Planning Organization: Journey to 2030

The Boston MPO's regional transportation plan, known as Journey to 2030, identifies "station improvements" as one of the primary needs of the MBTA transit system. Furthermore, Chapters 3, 6 and 8 of the plan explicitly call for achieving a "State of Good Repair" for the MBTA system (including parking structures), increasing available parking capacity, and improving security, respectively; Appendix B mentions the need for more park-and-ride facilities. Construction of the South Garage will address each of these needs in a manner that will provide the MBTA with seamless revenue control by incorporating the automated fare collection system.

In addition to increasing parking capacity, the South Garage design incorporates intelligent design measures as well as the automated Charlie Card revenue control system promoted by the MBTA. The vertical structure of the South Garage will provide protected cover for MBTA revenue vehicles, namely buses serving the eleven routes connecting with the Blue Line at Wonderland Station.

Journey to 2030 also calls for improved bicycle facilities and routes to foster bicycle connections with transit opportunities. The South Garage will provide safe, secure storage for 120 bicycles and will serve as a connection to off-street cycling at the Revere Beach Reservation as well as to the designated Bike-to-the-Sea trail serving the communities of Everett, Malden, Revere, Saugus, and Lynn. By accommodating cyclists, the South Garage Project will provide seamless modal transfer between bikes, buses, and the subway.

As a multi-modal facility, the South Garage improves the highway system as well as the transit system in Revere and the Boston region. Journey to 2030 establishes policy criteria for highway and mass transportation projects; categories for these criteria are listed in Table 3-1.

Table 3-1 Journey to 2030 Criteria for Measuring Performance of Highway and Transit Projects

Criteria for Measuring Performance	Highway Projects	Transit Projects
System preservation, modernization, and efficiency	X	
Mobility	X	X
Environment	X	
Safety and Security	X	
Environmental Justice/Regional Equity	X	X
Land Use and Economic Development	X	X
Utilization		X
Cost-Effectiveness		X
Air Quality		X
Service Quality		X

The South Parking Garage fulfills and exceeds the policy and performance criteria for both highway and transit projects. Each of these points is briefly addressed below and in many cases is discussed in greater detail elsewhere in this EA.

3.5.1 System Preservation, Modernization, and Efficiency

The South Garage will provide benefits to the existing arterial roadway system as well as the public transit system in the Boston metropolitan area. Route 1A and the nearby Butler Circle are both high congestion areas, particularly at peak travel hours. By improving and streamlining access and vehicular flows, the South Garage will reduce vehicle queuing at Butler Circle, improving the existing traffic flow from an overall Level F to Level C. In addition, Bell (Mahoney) Circle, where Routes 1A, 16, and 60 intersect, has been identified by the CTPS in the *2004 Congestion Management System Report, Mobility in the Boston Region Existing Conditions and Next Steps* as one of the most congested and crash-prone intersections in the Boston metropolitan area. By increasing the convenience and efficiency of access to Wonderland Station, the South Garage Project will encourage a modal shift from motor vehicles to public transit; this may reduce traffic along Route 1A and ease congestion at Bell (Mahoney) Circle.

Construction of the South Garage will also provide shelter for the ground-level busway approved by the Categorical Exclusion described in Section 1.2. The Project will also be consistent with the approved busway project by maintaining the pattern of segregated pathways for buses, other vehicles, and pedestrians. Section 4.3 provides additional details regarding traffic and transportation.

3.5.2 Mobility

The South Garage will function as a multi-modal connection point to promote use of the transit system serving Boston, Revere, and the North Shore. By increasing the parking availability at Wonderland Station, the South Garage Project will also be a catalyst for greater use of public transit. This will enable transit users to realize lower commuting costs and shorter private vehicle trips.

3.5.3 Environment

The South Garage Project will provide the following benefits to preserve and protect the surrounding environment while minimizing potential impacts:

- Expanded parking capacity will enable the Massachusetts Executive Office of Transportation to fulfill its environmental commitments enunciated in the State Implementation Plan;
- A roof-mounted array of photo-voltaic panels;

- The area of impervious surface will be reduced by approximately 2% over the entire MBTA-owned parcel, and will be reduced by 6-7% in the immediate vicinity of the proposed structure;
- Best Management Practices will improve stormwater management;
- Rainwater will be harvested and stored for use in irrigation and wash down activities;
- Improved viability of multi-modal connections with transit will increase ridership and reduce private vehicular travel, thus reducing associated emissions (see Section 4.4, Air Quality);
- Recharging infrastructure for electric cars and provisions for ride-sharing programs will promote responsible transportation decisions;
- Improved access will encourage greater use and enjoyment of notable historic and environmental sites and recreation resources (e.g., Revere Beach, a National Historic Landmark);
- By consolidating existing surface parking into a vertical structure, the Project will reduce potential heat island effects;
- Enhanced bicycle and pedestrian services and connections will promote healthy lifestyles.

3.5.4 Safety and Security

As described above, the South Garage will enhance and improve safety and security through clearly marked and well-lit pathways, segregated travel routes for buses, other vehicles, and pedestrians, well-designed internal markings and associated signalization, appropriate lighting, video surveillance and security practices, and ADA-compliant parking and elevator access.

3.5.5 Regional Equity and Environmental Justice

The South Garage Project is within a state-designated Environmental Justice area, and Wonderland Station is the transit hub for municipalities of Revere, Chelsea, and Lynn, which collectively represent the locus of highest persistent unemployment in the Boston metropolitan area. The South Garage is a critical step in an overall transit-oriented development plan envisioned for the area, since it will provide various transit-related benefits and will enable subsequent redevelopment east of Wonderland Station as part of a separate project known as Waterfront Square. Section 4.12 addresses environmental justice in greater detail.

3.5.6 Land Use and Economic Development

The South Garage will consolidate existing surface parking into a vertical structure, enabling other uses of adjacent land without compromising parking capacity, thus encouraging economic development in the City of Revere. The Massachusetts Executive Office of Housing & Economic Development has identified the Wonderland Station area as a Priority Development Site and Gateway City, further highlighting the importance of economic development at this site.

3.5.7 Utilization

The existing MBTA parking at Wonderland Station is utilized at a weekday rate of approximately 99%. Adding to the demand for parking, the MBTA increased Blue Line capacity by approximately 11% in 2008, and average daily ridership increased 3% to an average of 58,226 daily users. Furthermore, as the Blue Line terminus, Wonderland Station is a regional collector of transit users, and a parking shortage can deter ridership. The South Garage will expand the capacity of available parking while also increasing the convenience, safety, and efficiency of access to Wonderland Station. These improvements are intended to encourage greater utilization of public transit services.

3.5.8 Air Quality

Please see Section 4.4 for discussion of air quality.

3.5.9 Service Quality

The South Garage will improve the quality of service at Wonderland Station by providing safe and convenient access. Expanded parking will also alleviate existing shortages, and the distance from parking to transit platforms and bus boarding areas will be shorter than under existing conditions. The South Garage will be equipped with Charlie Card infrastructure to allow seamless revenue control for the MBTA.

Section 4.0

Affected Environment and Potential Project Impacts

4.0 AFFECTED ENVIRONMENT AND POTENTIAL PROJECT IMPACTS

As described herein, there are no significant impacts associated with the South Garage Project; rather, the Project will promote safe and efficient access to Wonderland Station, optimize MBTA bus service, improve stormwater management, and encourage use of public transit. Nonetheless, the Proponent has thoroughly evaluated mitigation measures to ensure the Project is shovel-ready and able to move forward in a timely fashion.

4.1 Registry of Motor Vehicles Office – Traffic Considerations

In conjunction with the Wonderland Station improvements, the Massachusetts Department of Transportation (MassDOT) Registry of Motor Vehicles Division is evaluating plans to construct a Registry of Motor Vehicles (RMV) office at the Station. Preliminary plans indicate that the office may encompass a maximum of 4,000 square feet and may be integrated into the South Parking Garage structure. Table 4-1 provides a preliminary assessment of the potential traffic characteristics of a 4,000-square-foot RMV office based on trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] for Land Use Code (LUC) 731, *State Motor Vehicles Department*.

Table 4-1 RMV Trip Projections

	Vehicle Trips (Two-Way)				
Time Period	(A) RMV (4,000 sf)[a]	(B = A x 0.15) Transit Use Reduction (15 Percent)	(C = A – B) Net Trips	(D = C x 0.10) Pass-By Trips (10 Percent)	(E = C – D) Net New Trips
Average Weekday Daily	664	100	564	56	508
Weekday Morning Peak-Hour	49	8	41	4	37
Weekday Evening Peak-Hour	68	10	58	6	52

[a]Based on ITE LUC 731, State Motor Vehicles Department.

As shown in Table 4-1, the RMV could generate up to 508 new vehicle trips on an average weekday (254 entering and 254 exiting), with 37 new vehicle trips during the weekday morning peak-hour and 52 new vehicle trips during the weekday evening peak-hour. These numbers reflect a 15 percent reduction to account for use of public transportation and a 10 percent reduction to account for pass-by trips (motorists who currently travel along Route 1A for other purposes who will visit the RMV and then continue to their original destination).

1 *Trip Generation*, Eighth Edition; Institute of Transportation Engineers; Washington, DC; 2008.

The values presented in Table 4-1 are conservative, since the RMV office will likely be smaller than 4,000 square feet and hence will generate lower actual traffic volumes than those used to develop the trip estimates presented in the table. Further, it is important to note that the peak traffic volume periods for the RMV office are generally non-coincidental with the peak periods of commuter activity at Wonderland Station. As such, and with completion of the planned access and circulation improvements within Wonderland Station and those to be completed along Route 1A to accommodate planned future development unrelated to the South Parking Garage, sufficient capacity should be afforded by the transportation infrastructure to accommodate the potential RMV office.

4.2 Land Use and Zoning

The Project site and surrounding area are in the City of Revere's RC-2 zoning district. Zoning regulations allow a wide variety of mixed-use commercial and residential uses within this district. The transportation use is pre-existing and ancillary to RC-2 uses. Therefore, the Project is consistent with local zoning regulations.

4.3 Transportation and Site Access

As a parking garage designed to improve access to the MBTA Wonderland Station and adjacent recreational attractions such as Revere Beach, the South Garage Project will attract a number of user types including bicyclists and pedestrians, in addition to vehicles. The Project will have positive implications for local transportation by supporting modal choice (e.g., car, bus, light rail, taxi, bicycle, and pedestrian) and access to public transit for all users. At the terminus of the MBTA Blue Line, the South Garage will serve not only the immediate Revere community but also the nearby and mid-North Shore communities of Lynn, Swampscott, Marblehead, Saugus, and others. The Project will intercept car trips from these communities into Boston, promoting public transit. The Project will lay a foundation for economic development and other efforts that will further activate the area, create accessible jobs, and strengthen the tax base of the City and Commonwealth of Massachusetts. As a key piece of infrastructure to support community livability and sustainability, the South Garage Project is an important component of preparing for the City's sought-after waterfront redevelopment.

4.3.1 Public Transportation

Wonderland Station, located immediately adjacent to the Project site, is the terminus of the MBTA Blue Line rapid transit service as well as a nodal point for twelve public bus routes (see Figure 4-1, Public Transportation System). The Blue Line connects to other MBTA rapid transit subway lines and public transportation services via State and Government Center Stations, the Commuter Rail system via North and South Stations, and interstate and regional bus service at South Station. The Blue Line also provides access to Logan International Airport via circulator bus service from Airport Station.

The Blue Line Station Modernization Project has recently increased Blue Line capacity by converting peak hour trains from four-car service to six-car service. In the latest ridership count conducted by the Metropolitan Planning Organization's Central Transportation Planning Staff (CTPS) in 2003-2005, existing daily Blue Line ridership totaled 11,190 passengers, with the morning peak hour servicing 1,542 passengers and the evening peak hour servicing 1,250 passengers. Under existing conditions, weekday bus ridership (two-way) varies from 130 to 4,388 patrons depending on the route.

4.3.2 Traffic

As reflected in the Project Description provided in Section 1.0, the South Garage Project consists of a parking garage that will consolidate existing surface parking into a structure adjacent to Wonderland Station; this MBTA-controlled facility will provide a parking supply sufficient to satisfy demand, thus protecting patrons from adverse impacts when adjacent non-MBTA-controlled surface parking is displaced due to other, unrelated development. The Project does not involve proposed changes to roadways outside the Project site boundaries, and it is compatible with the previously-approved busway and Route 1A improvements that will optimize safe and efficient travel (see Section 1.2). Signalized egress of vehicles on the ground level of the South Garage will prioritize MBTA buses, thus increasing the efficiency of bus service. Furthermore, improved intersections will provide access to the South Garage for southbound and northbound traffic along Route 1A, reducing congestion at Butler Circle and shortening travel times.

Traffic volumes in the study area were projected to the year 2018, the design year, reflecting a ten-year planning horizon from the baseline year of assessment. The design year analysis includes projects in the vicinity of the Project site that are proposed by other developers as well as an annual traffic background growth rate of 1%; the analysis describes conservatively high automobile traffic because it does not account for any diversion of trip type from automobiles to transit. By 2018, the South Garage is expected to add approximately 4,180 vehicle trips to the Route 1A corridor on an average weekday (2,090 entering and 2,090 exiting), with 586 additional vehicle trips (496 entering and 90 exiting) during the weekday morning peak hour and 476 additional vehicle trips (194 entering and 282 exiting) during the weekday evening peak hour. On a Saturday, the South Garage is expected to result in approximately 1,380 additional vehicle trips (690 entering and 690 exiting) traversing the Route 1A corridor, with approximately 210 additional vehicle trips (152 entering and 58 exiting) during the Saturday midday peak hour.

The traffic analysis assumes that construction of the South Garage, coupled with the planned development of an additional parking facility north of the Project, will redistribute traffic from a portion of Revere Beach Boulevard and Ocean Avenue to Route 1A. In addition to the parking redistribution, the 2018 Build condition assumes the South Garage will be associated with approximately 10% of motor vehicle trips generated by the independently-proposed Waterfront Square project located to the east.

Level of Service and vehicle queue results are presented in Table 4-2 for the 2018 Build with Mitigation condition for intersections in the Project vicinity.[2] Movements at studied intersections are projected to continue to operate at Level of Service D or better during peak periods.

Table 4-2 Level of Service (LOS) and Queue Summary

	2018 Build with Mitigation		
Signalized Intersection	*V/C [a]*	*Delay [b]*	*LOS [c]*
Route 1A at the Wonderland Station and Wonderland Park Driveways			
Weekday Morning Peak Hour	0.84	29.4	C
Weekday Evening Peak Hour	0.95	51.3	D
Saturday Midday Peak Hour	0.64	14.0	B
Wonderland Station Internal Driveway			
Weekday Morning Peak Hour	0.47	1.7	A
Weekday Evening Peak Hour	0.17	1.8	A
Saturday Midday Peak Hour	0.13	2.8	A
Rotary	*Demand [d]*	*Delay [e]*	*LOS [f]*
Butler Circle			
Weekday Morning Peak Hour	2,814	1.7	A
Weekday Evening Peak Hour	3,096	5.1	A
Saturday Midday Peak Hour	2,955	2.6	A

NOTES:

[a] Overall intersection Volume-to-capacity ratio.

[b] Overall Intersection Control (signal) delay in seconds per vehicle.

[c] Overall intersection Level-of-Service. Based on 2000 *Highway Capacity Manual* Signalized Intersection Levels of Service.

[d] Demand in vehicles per hour.

[e] Average stopped delay in seconds per vehicle.

[f] Overall intersection Level-of-Service. Based on 2000 *Highway Capacity Manual* Signalized Intersection Levels of Service, as defined in aaSIDRA 2.0 User Guide.

2 The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, D.C.; 2000.

4.3.3 Parking

Existing parking capacity along Route 1A occurs in off-street facilities on and adjacent to the Project site, including on the "Seaside Parcel" off Ocean Avenue, at Wonderland Park west of Route 1A, and at MBTA parking lots east of Route 1A (see Figure 1-6). The Project will provide a supply of parking consolidated into the vertical structure of the South Garage that will more than make up for the loss of existing surface parking within the garage footprint; furthermore, the MBTA will have control over the Project parking supply, thus insulating MBTA customers from the future loss of non-MBTA-controlled surface parking lots displaced by other, unrelated development. Figure 1-7 depicts post-construction parking in the Project area; the Project will not affect surface parking on other properties. Construction of the South Garage immediately adjacent to public transit services will promote MBTA ridership and enhance access for a variety of user types.

4.3.4 Pedestrian and Bicycle Facilities

Sidewalks are generally present along both sides of roadways near the Project site, with marked crosswalks and pedestrian traffic signal equipment and phasing at signalized intersections. According to pedestrian counts, the most active pedestrian crossing in the Project area is the Route 1A/Wonderland Station/Wonderland Park intersection during the weekday morning and evening peak hours: 396 and 380 pedestrians were observed crossing Route 1A during morning and evening peak hours, respectively. The majority of pedestrians completing this crossing are commuters using Wonderland Station but parking at the Wonderland Dog Track, a privately-owned lot. Construction of the South Garage will expand parking capacity immediately adjacent to Wonderland Station. This will reduce the number of pedestrians crossing Route 1A while shortening the distance pedestrians will need to walk between parking lots and the Station.

Existing accommodations for bicyclists consist of on-road routes that are located primarily north and east of the Project site (see Figure 4-2, Bicycle Facilities Map). North of the Project site, the Bike to the Sea Route is contiguous with Revere Street, and it links bicycle routes along Broadway (Route 107) and School Street/Malden Street to the bicycle facilities along Revere Beach Boulevard as well as recreational opportunities along the waterfront.

4.3.5 Transportation Mitigation Program

A comprehensive transportation mitigation program has been designed to accommodate traffic generation expected to result from the South Garage. Access to the South Garage will be provided by way of the existing signalized intersection of Route 1A with the Wonderland Station/Wonderland Park driveways, which will be reconstructed and improved in conjunction with the Project.

The planned improvements are depicted on Figure 4-3 (Conceptual Improvement Plan) and include the following elements:

- Widening of the Route 1A northbound approach to provide a right-turn lane;
- Widening of the Route 1A southbound approach to provide a left-turn lane;
- Reconstructing the Wonderland Station driveway to provide a single entering lane serving the South Garage and kiss-and-ride facility and three exiting travel lanes (a left-turn lane, a general purpose lane and a right-turn lane) serving the South Garage, kiss-and-ride, and buses (combined egress);
- Replacement of the existing traffic signal system;
- Development of an optimal traffic signal timing plan including an exclusive pedestrian phase for crossing Route 1A;
- Dedication of a secure, covered space large enough to accommodate storage of 120 bicycles that will be gated with controlled access for cyclists through the MBTA Charlie Card system; and
- Installation of all necessary appurtenances to provide an interconnected and coordinated traffic signal system with the proposed traffic signal to be located at the intersection of Route 1A at the Wonderland Station north driveway.

As shown in Table 4-2, the implementation of the planned improvements will result in overall operating conditions at the intersection of LOS D or better during peak periods.

For a construction-period transportation management plan, see Section 4.14.2.

4.4 Air Quality

The provision of parking in itself does not necessarily generate traffic. In fact, in the case of this Project, providing sufficient, safe parking at the MBTA station may increase public transit ridership and thus decrease automobile traffic and related emissions; furthermore, intersection upgrades and compatibility with the approved busway and Route 1A improvements will optimize traffic patterns, thus improving efficiency and reducing travel times. Since the Project will alter traffic flow patterns in the Project area, though will not generate traffic, Section 4.3.1 contains a hotspot analysis for carbon monoxide.

4.4.1 Hotspot Analysis

Air quality hotspot analyses typically examine ground-level carbon monoxide (CO) impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels because it is the most abundant pollutant

emitted by motor vehicles and can result in so-called "hot spot" (i.e., high concentration) locations around congested intersections. National Ambient Air Quality Standards (NAAQS), known as primary standards, have been established by the United States Environmental Protection Agency (EPA) for CO to protect public health. These standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period or 9 ppm for an eight-hour averaging period more than once per year at any location. The widespread use of CO catalysts on late-model vehicles has reduced the occurrence of CO hotspots. Air quality modeling techniques typically include using computer simulation programs to predict CO levels for both existing and future conditions to evaluate roadway compliance with the standards. The analysis for the South Garage Project followed the procedure outlined in EPA's intersection modeling guidance.[3]

The microscale hotspot analysis was conducted using the latest versions of EPA models MOBILE6.2 and CAL3QHC to estimate CO concentrations at sidewalk receptor locations. Existing (2008) and future (2018) emissions data calculated from the MOBILE6.2 model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections.

CAL3QHC results were added to background CO values to determine the Project's total air quality impacts. These values were compared to the NAAQS for CO of 35 ppm (1-hour) and 9 ppm (8-hour).

4.4.1.1 Intersection Selection

Intersection selection criteria for a hotspot analysis are typically based on a Level of Service (LOS) D where the project increases traffic volumes by ten percent or greater, or if the intersection operates at LOS E or F and the project degrades conditions at the location.

The traffic analysis focused on three intersections, each of which was also included in the air quality analysis:

(1) Route 1A and Revere Street;

(2) Route 1A and Shawmut Street; and

(3) Route 1A and the Wonderland Station and Wonderland Racetrack Driveways.

The latter two intersections involve physical changes to their layout for the future conditions. These changes are incorporated into the analysis of Build with Mitigation conditions. The first intersection (Route 1A and Revere Street) involves no physical changes

[3] U.S. EPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections; EPA-454/R-92-005, November 1992.

from Existing to Build and Build with Mitigation; thus, the Build and Build with Mitigation analyses are identical for this intersection. A detailed intersection traffic analysis of Existing conditions was not performed for Route 1A and Shawmut Street, and therefore this case is not analyzed in the hotspot analyses.

4.4.1.2 Emissions Calculations (MOBILE6.2)

The EPA MOBILE6.2 computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOBILE6.2 model are based on typical daily motor vehicle operations. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the state-specific vehicle age registration distribution. The input files for MOBILE6.2 for the existing (2008) and build year (2018) are provided by MassDEP. As is typical, minor edits to the files were necessary to allow the program to output emission factors for the various speeds used in the analyses.

The current version of MOBILE6.2 does not explicitly calculate idle emissions. However, idle emissions can be obtained from a vehicle speed of 2.5 mph (the lowest speed MOBILE6.2 will model). The resulting emission rate (in grams per mile) is then multiplied by 2.5 mph to estimate idle emissions in grams per hour. Moving emissions are calculated based on actual speeds at which free-flowing vehicles travel through the intersections. A speed of 40 mph was used for all Route 1A free-flow traffic, a speed of 30 mph was used for all side road free-flow traffic, and a speed of 15 mph was used for all turns.

For CO, winter emission factors typically exceed those for summer. Therefore, to be conservative, winter vehicular emission factors were used in the microscale hotspot analysis for the South Garage Project.

4.4.1.3 Receptors & Meteorology Inputs

Sets of up to 60 receptors were placed in the vicinity of each of the modeled intersections. Receptors extended 150-200 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of each modeled intersection are presented in Figures 4-4 through 4-7.

The CAL3QHC model requires limited meteorological inputs. Following EPA guidance[4], a wind speed of 1 m/s, stability class D (4), and a mixing height of 1,000 meters was used. To account for the intersection geometry, wind directions from 0° to 350°, at intervals of

4 U.S. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections.* EPA-454/R-92-005, November 1992.

10°, were selected. A surface roughness length of 108 cm corresponding to "City Land Use – Single Family Residential," the most conservative appropriate city surface roughness, was selected.[5]

4.4.1.4 Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at intersections based on worst-case meteorological conditions and traffic input data. The one-hour concentrations were scaled by a factor of 0.7 to estimate 8-hour concentrations. The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling runs. Travel speeds were estimated based on field observations, traffic data, and queue links at the intersections.

Traffic data at each of the three intersections collected during the morning peak hour, afternoon peak hour, and Saturday midday peak hour were included in the analysis.

4.4.1.5 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported on the U.S. EPA's AIRData website (http://www.epa.gov/air/data) was obtained for 2006-2008. MassDEP guidance specifies the use of the most recent three years of available monitoring data from within 10 km of a project site.

Background concentrations were determined from the available monitoring stations located nearest to the proposed development. The closest monitor, located three miles away at Bremen Street in East Boston, samples only sulfur dioxide. The next closest monitors in downtown Boston are not necessarily representative of the Project site in Revere: at a distance of 4.5 miles, the monitor at 301 Parkland in Lynn is the closest representative monitor that samples CO (CO sampling began in 2008).

Background concentrations of CO (in parts per million [ppm]) were required for the hotspot analysis. The corresponding maximum 1-hour and 8-hour background concentrations of CO at the Lynn monitor were 0.9 and 0.4 ppm, respectively.

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5 U.S. EPA, *User's Guide for CAL3QHC Version 2: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections*. EPA –454/R-92-006 (Revised), September 1995

4.4.1.6 Results

Results of the maximum one-hour predicted CO concentrations from CAL3QHC at each intersection are provided in Tables 4-3 through 4-6 for the Existing, No-Build, Build, and Build with Mitigation scenarios, respectively. Eight-hour average concentrations were calculated by multiplying the maximum one-hour concentrations by a factor of 0.7, in accordance with EPA guidance.[6]

The one-hour and eight-hour maximum modeled CO ground-level concentrations were added to EPA-provided background levels for comparison to the NAAQS. These values represent the highest potential concentrations at each intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology.

The highest one-hour traffic-related CO concentration predicted in the Project area under Existing conditions (2.30 ppm) plus background (0.9 ppm) is 3.20 ppm at the intersection of Route 1A and Revere Street. The highest eight-hour traffic-related CO concentration predicted in the area for Existing conditions (1.60 ppm) plus background (0.4 ppm) is 2.0 ppm.

The highest one-hour traffic-related CO concentration predicted in the Project area for the No-Build condition (1.90 ppm) plus background (0.9 ppm) is 2.80 ppm at the intersection of Route 1A and Revere Street. The highest eight-hour traffic-related CO concentration predicted in the area for the No-Build condition (1.30 ppm) plus background (0.4 ppm) is 1.7 ppm.

The highest one-hour traffic-related CO concentration predicted in the Project area for the Build condition (1.90 ppm) plus background (0.9 ppm) is 2.80 ppm at the intersection of Route 1A and Revere Street and at the intersection of Route 1A and the Wonderland racetrack and subway station/garage driveways. The highest eight-hour traffic-related CO concentration predicted in the area for the Build condition (1.30 ppm) plus background (0.4 ppm) is 1.7 ppm.

The highest one-hour traffic-related CO concentration predicted in the area of the Project for the Build with Mitigation condition (1.90 ppm) plus background (0.9 ppm) is 2.80 ppm at the intersection of Route 1A and Revere Street and at the intersection of Route 1A and the Wonderland racetrack and Station/South Garage driveways. The highest eight-hour traffic-related CO concentration predicted in the area for the Build with Mitigation condition (1.30 ppm) plus background (0.4 ppm) is 1.7 ppm.

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6 U.S. EPA, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources; EPA-454/R-92-019, October 1992

For all modeled conditions, and at all three modeled intersections, both the 1-hour and 8-hour CO concentrations are well below the respective NAAQS of 35 and 9 ppm. In addition, the predicted CO concentrations under the Build and Build with Mitigation conditions are no greater than under the No-Build condition.

Table 4-3 Summary of Hotspot Modeling Analysis (Existing 2008)

Intersection	*Peak*	*CAL3QHC Modeled CO Impacts (ppm)*	*Monitored CO Background Concentration (ppm)*	*Total CO Impacts (ppm)*	*NAAQS (ppm)*
1-Hour					
Route 1A & Revere Street	AM	2.3	0.9	3.2	35
	PM	2.2	0.9	3.1	35
	Sat.	2.2	0.9	3.1	35
Route 1A, Shawmut St, & North Driveway	AM	N/A	0.9	N/A	35
	PM	N/A	0.9	N/A	35
	Sat.	N/A	0.9	N/A	35
Route 1A, Wonderland Park and Station Driveways	AM	2.2	0.9	3.1	35
	PM	2.1	0.9	3.0	35
	Sat.	1.9	0.9	2.8	35
8-Hour					
Route 1A & Revere Street	AM	1.6	0.4	2.0	9
	PM	1.5	0.4	1.9	9
	Sat.	1.5	0.4	1.9	9
Route 1A, Shawmut St, & North Driveway	AM	N/A	0.4	N/A	9
	PM	N/A	0.4	N/A	9
	Sat.	N/A	0.4	N/A	9
Route 1A, Wonderland Park and Station Driveways	AM	1.5	0.4	1.9	9
	PM	1.5	0.4	1.9	9
	Sat.	1.3	0.4	1.7	9
Notes: CAL3QHC 8-hour impacts were conservatively calculated by multiplying 1-hour impacts by a screening factor of 0.7.					

Table 4-4 Summary of Hotspot Modeling Analysis (No Build 2018)

Intersection	*Peak*	*CAL3QHC Modeled CO Impacts (ppm)*	*Monitored CO Background Concentration (ppm)*	*Total CO Impacts (ppm)*	*NAAQS (ppm)*
1-Hour					
Route 1A & Revere Street	AM	1.6	0.9	2.5	35
	PM	1.9	0.9	2.8	35
	Sat.	1.7	0.9	2.6	35
Route 1A, Shawmut St, & North Driveway	AM	1.4	0.9	2.3	35
	PM	1.5	0.9	2.4	35
	Sat.	1.2	0.9	2.1	35
Route 1A, Wonderland Park and Station Driveways	AM	1.5	0.9	2.4	35
	PM	1.4	0.9	2.3	35
	Sat.	1.3	0.9	2.2	35
8-Hour					
Route 1A & Revere Street	AM	1.1	0.4	1.5	9
	PM	1.3	0.4	1.7	9
	Sat.	1.2	0.4	1.6	9
Route 1A, Shawmut St, & North Driveway	AM	1.0	0.4	1.4	9
	PM	1.1	0.4	1.5	9
	Sat.	0.8	0.4	1.2	9
Route 1A, Wonderland Park and Station Driveways	AM	1.1	0.4	1.5	9
	PM	1.0	0.4	1.4	9
	Sat.	0.9	0.4	1.3	9

Notes: CAL3QHC 8-hour impacts were conservatively calculated by multiplying 1-hour impacts by a screening factor of 0.7.

Table 4-5 Summary of Hotspot Modeling Analysis (Build 2018)

Intersection	*Peak*	*CAL3QHC Modeled CO Impacts (ppm)*	*Monitored CO Background Concentration (ppm)*	*Total CO Impacts (ppm)*	*NAAQS (ppm)*
1-Hour					
Route 1A & Revere Street	AM	1.6	0.9	2.5	35
	PM	1.9	0.9	2.8	35
	Sat.	1.7	0.9	2.6	35
Route 1A, Shawmut St, & North Driveway	AM	1.6	0.9	2.5	35
	PM	1.6	0.9	2.5	35
	Sat.	1.3	0.9	2.2	35
Route 1A, Wonderland Park and Station Driveways	AM	1.9	0.9	2.8	35
	PM	1.7	0.9	2.6	35
	Sat.	1.5	0.9	2.4	35
8-Hour					
Route 1A & Revere Street	AM	1.1	0.4	1.5	9
	PM	1.3	0.4	1.7	9
	Sat.	1.2	0.4	1.6	9
Route 1A, Shawmut St, & North Driveway	AM	1.1	0.4	1.5	9
	PM	1.1	0.4	1.5	9
	Sat.	0.9	0.4	1.3	9
Route 1A, Wonderland Park and Station Driveways	AM	1.3	0.4	1.7	9
	PM	1.2	0.4	1.6	9
	Sat.	1.1	0.4	1.5	9

Notes: CAL3QHC 8-hour impacts were conservatively calculated by multiplying 1-hour impacts by a screening factor of 0.7.

Table 4-6 Summary of Hotspot Modeling Analysis (Build with Mitigation 2018)

Intersection	*Peak*	*CAL3QHC Modeled CO Impacts (ppm)*	*Monitored CO Background Concentration (ppm)*	*Total CO Impacts (ppm)*	*NAAQS (ppm)*
1-Hour					
Route 1A & Revere Street	AM	1.6	0.9	2.5	35
	PM	1.9	0.9	2.8	35
	Sat.	1.7	0.9	2.6	35
Route 1A, Shawmut St, & North Driveway	AM	1.6	0.9	2.5	35
	PM	1.5	0.9	2.4	35
	Sat.	1.2	0.9	2.1	35
Route 1A, Wonderland Park and Station Driveways	AM	1.9	0.9	2.8	35
	PM	1.9	0.9	2.8	35
	Sat.	1.6	0.9	2.5	35
8-Hour					
Route 1A & Revere Street	AM	1.1	0.4	1.5	9
	PM	1.3	0.4	1.7	9
	Sat.	1.2	0.4	1.6	9
Route 1A, Shawmut St, & North Driveway	AM	1.1	0.4	1.5	9
	PM	1.1	0.4	1.5	9
	Sat.	0.8	0.4	1.2	9
Route 1A, Wonderland Park and Station Driveways	AM	1.3	0.4	1.7	9
	PM	1.3	0.4	1.7	9
	Sat.	1.1	0.4	1.5	9
Notes: CAL3QHC 8-hour impacts were conservatively calculated by multiplying 1-hour impacts by a screening factor of 0.7.					

4.4.2 Sustainability and Greenhouse Gas Emissions

A number of design measures will help reduce potential greenhouse gas emissions associated with construction and use of the Project area. The Project is focused on the smart growth principals of mixed use, density, walkable communities, and access to transit. At first it may seem counter-intuitive for a parking structure to promote sustainability, but the South Garage Project will enhance and improve access to public transit services, thus increasing ridership and reducing single-occupancy vehicle travel. By incorporating the approved busway relocation and new kiss-and-ride into the ground level of the garage, the Project will also improve the operational efficiency of the public transit facilities. Improving the parking facilities adjacent to Wonderland Station will encourage greater use of public transit.

The Project is also designed to encourage users to engage in responsible transportation-related decisions. At least 20 parking spaces will be designated for vanpools and carpools, and additional spaces will be provided for shared-car programs such as Zip-Car. The South Garage will be equipped with recharging outlets for electric vehicles. A secure storage area will be large enough to accommodate at least 120 bicycles.

The MBTA South Garage design includes a roof-mounted 20,000-square-foot Photo-Voltaic (PV) array that is expected to generate 200 KW. Project engineers anticipate that this PV array will provide power for the South Garage and perhaps the MBTA Wonderland Station, with any surplus sold back to the energy grid. This type of sustainable design element provides a model of green design and development for the MBTA, the Commonwealth, and the FTA.

4.5 Noise

The noise assessment for the South Garage Project conforms to the approach required by the FTA as described in the "Transit Noise and Vibration Impact Assessment," FTA-VA-90-1003-06, May 2006. This assessment focuses on potential noise impacts associated with Project operations, including automobile traffic entering, exiting, or passing through the garage as well as ventilation fans for mechanical rooms, air-cooled condensing units, transformers in the electrical room, and a generator.

Although not explicitly mentioned in the FTA manual, other potential noise impacts could result from the proposed structure's effects on sounds from existing sources. Train and bus noise, for example, could reflect off the parking garage wall and potentially increase the resulting sound level that reaches sensitive uses nearby. Bus traffic at the ground level of the garage is not included in this noise assessment since the busway has already been approved by Categorical Exclusion (see Section 1.2) and is not part of the South Garage Project; the Project will not cause bus traffic to increase.

4.5.1 FTA Noise Impact Assessment Method

In accordance with the FTA manual, noise impacts are assessed by comparing future sound levels to existing sound levels. The severity of the impact is a function of the existing noise level, the amount by which the Project will increase the existing noise level, and the category of land use affected by the noise.

The FTA manual uses two A-weighted sound levels to describe cumulative noise exposure: (1) the hourly equivalent sound level L_{eq}, "an hourly measure that accounts for the moment-to-moment fluctuations in A-weighted sound levels due to all sound sources during that hour, combined"; and (2) the day-night sound level L_{dn}, a weighted[7] average noise level based on a calculation of the average sound level over a 24-hour day that the FTA uses for land uses where nighttime sensitivity is a factor, such as residences or apartments. The FTA manual uses L_{eq} during the hour of maximum transit noise exposure for land use involving only daytime activities. Three land use categories are defined by the FTA manual and are described in Table 4-7.

Table 4-7 FTA Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Description	Noise Metric (dBA)
1	Tracts of land where quiet is an essential element in their intended purpose (e.g., lands set aside for serenity and quiet, outdoor amphitheaters, and concert pavilions).	Outdoor L_{eq} *
2	Residences and buildings where people normally sleep (e.g., homes, hospitals, and hotels).	Outdoor L_{dn}
3	Institutional land uses with primarily daytime and evening use (e.g., schools, libraries, theaters, and churches).	Outdoor L_{eq} *

* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

The FTA manual defines three classes of impacts: "no impact," "moderate impact," and "severe impact." "No impact" means, at most, an insignificant increase in the number of people highly annoyed by the new noise, and consideration of mitigation is not required. Figure 4-8 (FTA Noise Impact Criteria for Transit Projects), reproduced from the FTA manual, shows the three classes of impact, which are based on comparisons between existing outdoor noise levels and future project noise levels for various land use categories.

7 The weighting includes a 10-decibel (dB) penalty added to L_{eq} levels from 10:00 pm to 7:00 am.

According to the FTA manual, for a parking facility with a capacity of 1,000 vehicles or more, the unobstructed screening distance is 125 feet, which means that a noise analysis must be conducted if there are any noise-sensitive receptors within 125 feet of the facility. Since the South Garage will have a peak hour flow rate of approximately 500 vehicles per hour, the screening distance decreases to 100 feet. This criterion makes it necessary to perform a noise assessment for the Project since the east wall of the South Garage will be approximately 92 feet from the closest point of Waters Edge Tower on Ocean Avenue.

The noise assessment was conducted in accordance with FTA guidelines: existing sound levels were measured, the measured levels were analyzed to determine existing day-night sound levels, future levels were predicted using measured and FTA reference levels, and potential impacts were assessed by comparing future Project sound levels to existing sound levels.

4.5.2 Existing Ambient Sound Levels

Noise monitoring was conducted at four locations shown on Figure 4-9 (Sound Monitoring Locations) and described in Table 4-8; daytime measurements were taken on June 16, 2009 between 11:50 am and 4:25 pm, and nighttime measurements were taken on June 17 between midnight and 2:30 a.m. Monitoring locations were selected from the proposed site plan to represent noise-sensitive receptors nearest to the Project in each direction. At each location, A-weighted sound levels were collected for a period of 60 minutes during daytime (an option recommended in the FTA manual when conducting a detailed noise analysis) and 20 minutes during nighttime. Road conditions were dry, and wind speeds did not exceed 8 miles per hour.

Table 4-8 Noise-Sensitive Receptor Locations: measured L_{eq} sound levels (dBA) during daytime and nighttime

Receptor Location	Existing Hourly L_{eq} – Daytime	Existing 20-minute L_{eq} - Nighttime
1: East of Project site, at NW rear of condominium building on Ocean Avenue (residence nearest to project, shielded from ambient traffic on Ocean Ave. and Revere Beach Blvd.).	61	61
2: Northeast of Project site, near SW gate of town parking lot on Baker Ave.	59	59
3: NW of Project site, at the northeast corner of Wonderland Parking Lot.	61	50
4: South of Project site, at the SE corner of private parking lot near residences and NW of intersection of Kimball Ave. and Route 1A.	56	50

Ambient sound pressure level data were collected at each location with a precision CEL Instruments 593 Sound Level Analyzer (meeting Type 1 requirements of ANSI S1.4-1983, IEC 60651:1979, and IEC 60804:2000). The CEL Analyzer was calibrated before and after the measurement program using a CEL Instruments 110/1 sound calibrator. The meter was set at a height of five feet above ground. Data were processed at a sampling rate of one per second using the "slow" response setting on the meter. L_{eq} levels were determined from the data collected during each sampling period.

At locations 1 and 2, L_{eq} sound levels were dominated by train noise during daytime and nighttime periods. At location 1, the primary noise-producing events included 14 MBTA trains and 4 airplanes between 11:50 am and 12:50 pm, and at night three MBTA trains between 12:32 and 12:52 am. At location 2, 14 MBTA trains and 4 airplanes passed by between 1:10 and 2:10 pm, and 1 MBTA train passed by between 12:58 and 1:18 am.

In contrast, there were no discernable train events at location 3 during the monitoring periods. Daytime (i.e., 2:17-3:17 pm) ambient noise at location 3 was affected by 6 airplanes, moderate traffic on Route 1A, and birds in nearby trees. Nighttime (i.e., 1:25-1:45 am) ambient noise was influenced by 2 airplanes, light traffic on Route 1A, and frogs in a nearby wetland; no MBTA trains were scheduled during the night monitoring period.

Location 4 did not have any discernable MBTA train noise during the monitoring period, and there were no scheduled MBTA trains during the nighttime monitoring period. Daytime (i.e., (3:24-4:24 pm) ambient noise was influenced by 6 airplanes, moderate traffic on Route 1A and the adjacent street, and sounds from the auto-body shop across the street. Nighttime (i.e., 1:50-2:10 am) ambient noise was influenced by 1 airplane, light traffic on Route 1A, and mechanical noises from the grocery store to the northwest.

L_{dn}, the 24-hour day night sound level, is the FTA noise metric for evaluating impact at residential land categories. L_{dn} values were calculated at each location based on the measured one-hour daytime and 20-minute L_{eq} values, assuming the daytime L_{eq} value was the same during each hour of train operation. L_{dn} values for locations 1, 2, 3 and 4 were calculated as 65, 64, 65, and 61 dBA, respectively.

Only location 1 was a focus of the comprehensive noise analysis, since locations 2, 3, and 4 are outside the applicable screening distance for parking facilities and since possible effects from reflected train and bus noise will be greater at location 1 than the other monitoring locations. Location 1 is the residence located nearest to the proposed South Garage (see Sections 4.4.3 and 4.4.4 for an analysis of how the proposed Project will affect noise levels).

To determine the existing L_{dn}, it is necessary to determine the existing noise coming from trains and buses; train noise was determined from measurements and bus noise from values defined in the FTA manual. Using the time history of the measurements at location 1 and notes taken in the field, the average sound exposure level (SEL) was determined from

individual train operations. The SEL describes a receiver's cumulative noise exposure from a single noise event (e.g., a train passing by). During the two measurement periods at location 1, 17 train events (9 arrivals and 8 departures) occurred. The average SEL for an arriving train was about 4 dBA lower than the average SEL for a departing train, and the energy average SEL of all train events was 85 dBA. Knowing the SEL from train events makes it possible to "subtract" the influence of train activity from the overall L_{eq} at location 1. For example, during the daytime, the measured 1-hour L_{eq} at location 1 from 14 trains was 60 dBA and the L_{eq} for non-train operations was 51 dBA; during nighttime, the measured L_{eq} for 20 minutes from 3 trains was 61 dBA and from non-trains was 52 dBA. The calculated L_{dn} from train operations is only 64 dBA, which was obtained by using the average SEL for trains and the number of train operations in each hour as listed in the MBTA schedule.

Although the approved busway is not yet in operation, its estimated noise should be part of the existing noise conditions used when making comparisons to FTA criteria. The FTA manual provides reference SEL values (using a 50-foot reference distance) for bus pass-bys and bus idling. These were used to calculate SELs at location 1 from each bus operation (i.e., entering, dropping off and picking up, and leaving the area). Calculated bus SELs were used to determine the one-hour L_{eq} values for each hour of the day. Based on these calculations, L_{dn} from existing sources is presented in Table 4-9; the table breaks down L_{dn} into associations with train-only operations, bus-only operations, all other sources, and a cumulative condition. The L_{dn} for "existing" bus operations (including the approved busway) is 62 dBA, which is 2-3 dB less than the existing MBTA train L_{dn}. The cumulative L_{dn} calculated from all existing sources (i.e., trains, buses, airplanes, vehicle traffic, etc.) is 67 dBA.

Table 4-9 Existing Day-Night Sound Level L_{dn} from Existing Sources at Location 1 (nearest noise-sensitive property)

Existing Source	Partial L_{dn}, dBA	Combined L_{dn} from all existing sources, dBA
MBTA trains	64	
Buses at approved busway*	62	
Other sources (airplanes, vehicle traffic on Route 1A	57	
Combined, all existing sources		**67**

* Note: Busway is not yet in operation but is approved and will be an "existing source" when the South Garage is constructed.

4.5.3 Project Noise levels

The impact assessment considers four sources of noise: South Garage vehicle operations (excluding the approved busway and kiss-and-ride), mechanical and electrical equipment associated with the garage (ventilation fans, air cooled condenser units, transformers, and a generator), reflections of MBTA train noise off the proposed wall, and reflections of MBTA bus noise off the proposed wall. For the latter two sources, the "Project noise" is the additional noise from the reflected sound and not the existing noise from trains or buses.

South Garage Vehicle Operations

The FTA manual screening procedure assumes that peak hour L_{eq} noise from a parking facility reaches 50 dBA at a distance of 125 feet, assuming a peak traffic rate of 1,000 cars per hour. With the peak rate at the South Garage estimated at approximately 500 cars per hour, Project noise will be 50 dBA at a distance of 100 feet from the facility; this is significantly less than existing train and bus noises. Furthermore, the garage structure will shield existing Route 1A traffic noise and reduce it slightly. The overall effect of the parking garage sound levels is insignificant and was not considered further.

Mechanical and Electrical Equipment

The FTA manual does not include information on ventilation fans or air-cooled condenser units related to mechanical spaces; this is the only type of ventilation fan proposed, since the South Garage itself will be naturally ventilated. Based on data provided, the sound levels from this equipment will be significantly less than levels from existing trains and buses, and the resulting L_{dn} will be less than 45 dBA at a distance of 100 feet. Since the transformers will be located in enclosed rooms, no measureable transformer noise will reach the nearest residence. The generator sound will be about 50 dBA at the nearest residence; L_{dn} from the transformer will be significantly less since it operates only intermittently in an emergency or during testing.

Reflected Noise from Trains and Buses

The double-bay ground level wall on the east side of the South Garage will reflect some noise from adjacent MBTA trains and buses. The increase in sound level due to reflections off the wall will depend on the total distance traveled by the sound waves (i.e., the source-to-wall distance plus the wall-to-receiver distance). In determining reflected noise levels, it was assumed that noise emissions will project equally from either side of trains or buses. Although the noise modeling conservatively estimated the eastern double-bay ground-level wall as being 25% open, the level of reflected sound will also depend on the actual portion of this wall that is open rather than constructed of solid material. Reflected sound will have its greatest effect at the residential building located directly east of the South Garage, while effects will be diminished or non-existent at other locations.

As shown in the FTA manual, train noise was modeled as a line source, using a reflected noise path to direct path ratio of 0.36. Considering this condition combined with the effect of the open area on the wall results in a reflected train SEL level that is 6 dB lower than the direct existing SEL train level. The resulting partial L_{dn} from reflected train noise is 58 dB, and the combined train (i.e., existing train noise plus reflected train noise) L_{dn} will be 65 dBA; this will be an increase of 1 dB over existing train noise, which will be imperceptible.

Following the FTA manual, the bus idle noise was modeled as a point source (a 6 dB decrease per doubling of distance) and the operating noise as a line source (a 3 dB decrease per doubling of distance). The idle noise was modeled closer to the east and the operating noise closer to the wall. In addition, since the third level of the parking garage will overhang the bus lane, it was assumed there would be an additional increase in bus noise due to some reverberation between the floor, wall, and ceiling. The analysis assumed the average bus speed travelling in the lane next to the wall would be 15 mph and the average idle time would be 60 seconds. Modeling showed that the reflected SEL for the bus when received at location 1 will be 2-3 dB lower than the direct bus sound level without the garage in place. The partial L_{dn} for reflected bus noise will be 59 dBA and the combined (existing plus reflected) future bus noise L_{dn} will be 64 dBA, an increase of only 2 dBA over existing bus noise.

Project noise L_{dn} (the train and bus noise reflecting off the garage wall which is then received at the residential buildings to the east) will be 62 dBA. The contributions from automobile activity in the South Garage and ventilation fans for the mechanical rooms will not increase this level. The combined future noise, which includes existing and Project noise levels, will be 68 dBA (see Table 4-10).

Table 4-10 breaks down existing and Project noise levels by source and presents a combined future level. This table shows that Project noise will be less than existing noise, and the combined (existing plus Project) future noise is only slightly greater than existing noise.

Table 4-10 Existing and Future Day-Night Sound Level L_{dn} from Project Sources at Location 1 (nearest noise-sensitive property)

Source	*Existing L_{dn}, dBA*	*Project L_{dn}, dBA*	*Combined future L_{dn}, dBA*
Train	64	58	65
Bus	62	59	64
Other	57	<50	57
Total	*67*	*62*	*68*

4.5.4 Noise Impact Assessment

According to Table 3.1 of the FTA manual, if the existing noise L_{dn} is 67 dBA, there is no impact at residential properties if the Project noise L_{dn} is less than 63 dBA. The conservative estimate of Project noise L_{dn} from all sources is 62 dBA (see Table 4-10), and therefore there will be no impact from Project noise at the residential building directly east of the South Garage. This is a reasonable conclusion since the slight increase in existing noise will be solely from reflected train and bus noise. Subjectively, this will result in an inaudible increase in noise from each train pass-by and a barely (if at all) noticeable increase in noise from each bus operation. Furthermore, this barely noticeable or inaudible increase in noise levels attributed to each individual event is not expected to increase the number of "highly-annoyed" individuals related to impact classification.

Since effects from reflected train and bus noise are greatest at the residential property directly east of the South Garage, the increase in noise will be even less or perhaps non-existent at other residential sites. Therefore, there will be no impact in the community from noise created by the South Garage Project.

4.6 Stormwater, Floodplain, and Wetlands

The Project is located within Zone AE of the 100-year floodplain as defined by the National Flood Insurance Program of the Federal Emergency Management Agency, meaning that it is within an area subject to inundation by a flood event with a 1% annual chance of occurrences. The Project, however, is proposed on a previously-developed site and will improve conditions on the Project site with regard to water quality including stormwater quality, stormwater volume, and wetlands protection. In addition, all parking levels of the South Garage will be above the floodplain elevation, and the structural design at ground-level is intended to allow maximum flow-through, consistent with proper function as a garage. Enclosed building areas are proposed at a minimum elevation of one foot above the base flood elevation of 11 feet (NGVD 1929) to further separate such spaces from potential floodwaters. The South Garage will also contain an emergency generator, located above flood elevation, for life safety systems. Furthermore, provisions for compensatory flood storage will ensure that the Project will have no adverse effects on flood stage or extent of flooding within the watershed (see Section 4.5.2.3).

Under existing conditions, stormwater flows untreated from surface asphalt parking lots and collects in a closed drainage system on site that discharges into the Eastern County Ditch, a manmade drainage channel that lies just north of the Project site and ultimately discharges into the state-designated Rumney Marshes Area of Critical Environmental Concern (see Figure 1-1). The Project will reduce the amount of impervious surface area on the MBTA property by approximately 2.1% and will establish stormwater management controls; more specifically, the amount of impervious surface area will be reduced by approximately 6% at the southern end of the MBTA property where the bulk of construction activities will occur (i.e., the area labeled as the "MBTA South Lot" on Figure 1-6). These gains will be made

primarily with various landscape treatments outside the garage footprint that will replace the existing impermeable surface. The existing stormwater management system will be upgraded to comply with the Massachusetts Department of Environmental Protection's (MassDEP's) stormwater management regulations and standards and those of the United States Environmental Protection Agency (EPA) (see Section 4.5.2.4), and will also incorporate Low Impact Design measures.

4.6.1 Existing Conditions and Impacts

No federal wetlands exist on the South Garage site. Stormwater management improvements will, however, affect a small area of federal wetlands associated with a tributary of the Eastern County Ditch: approximately 22 linear feet of riprap will be installed to stabilize approximately 210 square feet of the bank and bottom at the existing outfall pipe which conveys treated stormwater into the tributary. The riprap will decrease the amount of scouring and erosion that currently occurs, thus minimizing sedimentation and improving water quality. In this location, the tributary channel is approximately three to five feet wide. Placing riprap along the face of the bank will not impair its capacity to provide breeding habitat, escape cover, and food for fisheries (to the extent such functions exist in this disturbed stretch of Bank). Within the Ditch tributary itself, bottom sediments are unconsolidated and the resource is littered with debris including bottles and cans, and, further downstream, tires and shopping carts. Little to no vegetation exists below the water line. The banks of the tributary are vegetated with invasive species such as common reed (*Phragmites australis*) and Japanese knotweed (*Polygonum cuspidatum*).

In accordance with the Massachusetts Wetlands Protection Act, the Proponent submitted a Notice of Intent (NOI) to the Revere Conservation Commission, the local wetlands regulatory body, on April 27, 2009. The Commission issued an Order of Conditions approving the Project on June 3, 2009. Proposed stormwater management improvements were also reviewed and affirmed by the EPA during the Massachusetts state environmental review process.

4.6.2 Mitigation

The Project includes measures designed to minimize and mitigate any potential impacts related to water quality, floodplain risk, and wetlands; in fact, the Project will improve water quality and wetlands relative to existing conditions, and will not exacerbate floodplain risk. As described below, mitigation measures include construction-period best management practices, design features of the South Garage structure, a plan for managing stormwater, and a provision for compensatory flood storage in accordance with local, state, and federal regulations. The Project will not result in significant impacts, but the Proponent has taken care to consider appropriate mitigation measures in an effort to be shovel-ready and proceed with the South Garage in a timely manner.

4.6.2.1 Construction-Period Mitigation Measures

Erosion and Sediment Control

An erosion and sediment control program will minimize the risk of impacts to wetland resource areas during Project construction. The program will incorporate Best Management Practices (BMPs) specified in MassDEP and EPA guidelines and will comply with requirements of the NPDES Phase II Construction General Permit for Storm Water Discharges from Construction Activities and MassDEP. Proposed measures include temporary erosion and sediment controls and soil management; areas of exposed soil will be kept to a minimum, and a permanent vegetative cover will be established as soon as practicable after final grading. Erosion and sediment control measures proposed for site preparation and development phases will include the following components:

- *Siltation Barriers*: Siltation barriers composed of double-staked hay bales (weed free) and trenched silt fence will be installed in appropriate locations to demarcate the limit of work, form a work envelope, and provide assurance that construction equipment will not enter the Eastern County Ditch. Barriers will remain in place until disturbed areas are stabilized. An adequate stockpile of erosion control materials will be kept on site for emergency or routine replacement.

- *Temporary Sedimentation Basins and Diversion Swales*: If necessary, temporary sedimentation basins will be constructed to prevent off-site transport of fine-grained sediment. Sediment that collects in the basins will be removed and disposed of at a suitable location. If necessary, temporary diversion swales will be constructed to route runoff into the sedimentation basins. Check dams consisting of staked haybales, silt fence, or crushed stone will be installed at periodic intervals within these temporary diversion swales.

- *Catch Basin Inlet Protection*: Inlets of new or existing catch basins will be protected from sediment inflow during the work period through installation of "silt sacks," placement of gravel, or a barrier of staked haybales. If gravel is used, a layer of filter fabric will be installed beneath the catch basin grates.

Dewatering Protocol

Should the need for dewatering arise during installation of the South Garage foundation, groundwater will be pumped directly from the work area into geotextile filter bags, temporary settling basins, or portable fractionation tanks (depending on the volume of water); these BMPs will act as sediment traps during construction. Groundwater discharge points will be set back from the edge of the Eastern County Ditch and monitored by qualified personnel. Discharges shall be free from visible floating, suspended, and settleable solids that could impair the functions of a wetland or degrade the chemical composition of the resource area receiving discharged water.

Spill Prevention and Response Plan

During construction, a spill containment kit will be kept on site in the construction manager's office. In the event of an accidental release of petroleum product into a wetland resource area, the Revere Conservation Commission will be notified along with emergency response agencies, if appropriate. Equipment will be serviced or maintained off site and kept in a condition that prevents leakage or discharge of pollutants.

4.6.2.2 Post-Construction Stormwater Management

The proposed stormwater management system is designed to comply with MassDEP stormwater management standards incorporated into the Regulations on January 2, 2008 (see 310 CMR 10.05(6)(k)). In accordance with these regulations, the Project is classified as a redevelopment of a previously-developed site; it is therefore designed to comply with the stormwater standards to the maximum extent practicable (see Section 4.5.2.4). The proposed design will not alter the drainage patterns on the site, and will maintain the single existing discharge into the Eastern County Ditch. Installing a modern stormwater management system on the Project site will, however, significantly decrease sediment and pollutant loads entering the Eastern County Ditch. The proposed system will remove approximately 84% of Total Suspended Solids (TSS) using a proprietary stormwater treatment unit (i.e., Vortechs) on the reconstructed closed drainage system. In addition, roadway drainage will include deep sump/hooded catch basins to further pre-treat stormwater runoff. New landscaping will reduce the impervious area on the site by approximately 2.1%. Subsurface recharge leaching beds proposed at Wonderland Station will provide all of the stormwater recharge volume required for the Project; the required recharge storage volume is 2,556 square feet, and the infiltration system is designed to provide 2,608 cubic feet of storage. These beds will be constructed of subsurface perforated pipes and crushed stone. As a result, the peak rate and volume of stormwater runoff draining to the Eastern County Ditch will decrease.

During typical snow plowing operations, snow will be pushed to the designated snow removal areas; snow will not be stockpiled in Low Impact Development areas such as rain gardens, bio-swales, porous pavement, porous pavers, or other drainage system elements, as determined by the Revere Conservation Commission. In severe conditions when snow cannot be stockpiled on site, snow will be removed from the site and properly disposed. These measures were detailed in the draft long-term pollution prevention plan submitted to the Revere Conservation Commission with the NOI Stormwater Report and reviewed prior to the Commission's issuing the Order of Conditions on June 3, 2009. The draft long-term pollution prevention plan defines suitable practices for post-construction source control and pollution prevention on the Project site. This draft plan addresses numerous considerations associated with site maintenance and operations: good housekeeping practices; provisions for storing materials and waste products inside or under cover; vehicle washing controls; requirements for routine inspection and maintenance of stormwater BMPs; spill prevention and response plans; provisions for landscaping maintenance; requirements for storage and

use of fertilizers; herbicides, and pesticides; pet waste management provisions; provisions for solid waste management; snow disposal and plowing plans; winter road salt and/or sand usage and storage restrictions; street sweeping schedules; provisions for preventing illicit discharges to the stormwater management system; training requirements for personnel involved with implementing the plan; and a list of emergency contacts.

The Project includes plans to install large below-grade collection tanks (i.e., 8,000-10,000 gallon capacity) adjacent to the South Garage to gather and store rainwater. This rainwater harvesting will reduce the volume of stormwater runoff while creating a supply of water for landscape irrigation and wash down of the garage and Station platform. Regular maintenance and wash down of the garage will prevent build-up of contaminants, such as oil drippings, which could otherwise be swept into stormwater. In addition, the Project will increase the pervious area on the Project site and will improve stormwater management.

4.6.2.3 Compensatory Flood Storage

The Project is also designed to create an area of compensatory flood storage to mitigate the volume of floodplain that will be occupied by the proposed South Garage structure. Construction of the South Garage will displace a flood storage volume of approximately 23,300 cubic feet, and the Proponent proposes to create a slightly larger volume (27,680 cubic feet) of compensatory flood storage at the northern end of the existing MBTA North Parking Lot (see Figure 1-1). A portion of this work will occur within the 100-foot Buffer Zone to state-defined Inland Bank associated with the Eastern County Ditch and was approved in the Order of Conditions issued by the Revere Conservation Commission. Creating the compensatory flood storage area will involve regrading and repaving an approximately 44,000-square-foot section of existing parking lot as shown in Figure 4-10 (Compensatory Storage Area Grading Plan). This area will slope down approximately one foot from an existing elevation of 7 feet (NGVD 1929) to approximately 6 feet (NGVD 1929). After this regrading, the area will remain suitable for commuter parking.

As a result of this compensatory flood storage, the Project will not adversely affect the flood stage or extent of flooding within the watershed. Furthermore, since flooding of the Project site from a coastal storm would involve storm surge overtopping Revere Beach Boulevard, the Project is not anticipated to have a detrimental effect on flood velocity or flow, nor increase the magnitude of erosion or sedimentation that could occur during a coastal storm. In addition, by incorporating new green space and an improved stormwater management system into the proposed design, the Project will reduce the volume of stormwater runoff relative to existing conditions. These improvements will attenuate flooding conditions during rainfall events and will likely provide some attenuation during a coastal storm surge flood event.

4.6.2.4 Compliance with Stormwater Management Standards

As described above, the Project will incorporate Best Management Practices (BMPs) specified in MassDEP and EPA guidelines and will comply with requirements of the NPDES Phase II Construction General Permit for Storm Water Discharges from Construction Activities. The South Garage Project is also designed to comply with applicable Stormwater Management Standards set forth in the MassDEP regulations. Given its location on a previously-developed site, the Project is regulated as a redevelopment project and is required to meet Standards 1, 2, and 3 to the maximum extent practicable as well as the pretreatment and structure BMP requirements of Standards 4, 5, and 6. As a redevelopment project, the Project must also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

As described below, each of the ten standards has been addressed in the Project design:

1. *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

   Compliance: The proposed design will comply with this Standard, as there will be no untreated stormwater discharge associated with this Project. MassDEP Stormwater Management Standards allow discharges only of treated water into the wetlands area.

   Water quality treatment BMPs incorporated into the stormwater management system will adequately treat stormwater prior to any discharge, with the Vortechs system sized to achieve 84% TSS removal, satisfying the 80% requirement (see Standard 4 below). The existing stormwater outfall at the tributary channel of the Eastern County Ditch will be protected with riprap for a distance of 22 feet from the outlet. The riprap is designed to minimize erosion or scour at the outfall itself and to prevent the transport of sediment downstream.

2. *Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

   Compliance: The Project will comply with this Standard. The stormwater management system is designed so that the post-development peak discharge rate will be less than the existing rate. This reduction in the peak rate of discharge is primarily due to proposed landscape treatments that will increase the amount of pervious area on the Project site and promote groundwater recharge. Pre-Development (i.e., existing) and post-development (i.e., proposed) drainage area maps are provided as Figures 4-11 and 4-12, respectively.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

Compliance: The Project will comply with this Standard to the maximum extent practicable and will result in a significant improvement over existing conditions. The Project will increase stormwater recharge into the ground such that annual post-construction recharge will exceed the annual recharge under existing conditions. Consolidating existing surface parking into the proposed South Garage and using various permeable landscape treatments will decrease the impervious surface area on the site by approximately 6,593 square feet, a 2.1% reduction. The subsurface recharge leaching beds proposed at Wonderland Station will provide all of the stormwater recharge volume required for the Project; the required recharge storage volume is 2,556 square feet, and the infiltration system is designed to provide 2,608 cubic feet of storage. These beds will be constructed of subsurface perforated pipes and crushed stone.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when: suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; structural stormwater BMPs are sized to capture the required water quality volume as determined in accordance with the Massachusetts Stormwater Handbook; and pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

Compliance: Under the Regulations, redevelopment projects must improve existing conditions, and new stormwater controls must be incorporated into the design to reduce annual stormwater pollutant loads from the site. The proposed Project includes water quality treatment BMPs in the stormwater management system to increase TSS removal and promote recharge rather than overland flow.

Drainage from the South Garage roof deck and roadway surfaces on the site will flow into an underground infiltration system. A water quality treatment BMP, a Vortechs system, is included in the design of the closed drainage system to ensure stormwater runoff is treated prior to its introduction into the infiltration system. The Vortechs unit is sized to remove 84% of TSS from runoff entering the stormwater management system. In addition, roadway drainage will include deep sump/hooded catch basins to further pre-treat stormwater runoff.

The Proponent has developed a draft long-term pollution prevention plan to define suitable practices for post-construction source control and pollution prevention on the Project site. This draft plan addresses numerous considerations associated with site maintenance and operations: good housekeeping practices; provisions for storing materials and waste products inside or under cover; vehicle washing controls; requirements for routine inspection and maintenance of stormwater BMPs; spill prevention and response plans; provisions for landscaping maintenance; requirements for storage and use of fertilizers; herbicides, and pesticides; pet waste management provisions; provisions for solid waste management; snow disposal and plowing plans; winter road salt and/or sand usage and storage restrictions; street sweeping schedules; provisions for preventing illicit discharges to the stormwater management system; training requirements for personnel involved with implementing the plan; and a list of emergency contacts.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If, through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Water Act, M.G.L. c.21, §§26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

Compliance: This Project will comply with the pollution prevention requirements of this Standard. Per the Overview of Massachusetts Stormwater Management Standards, Chapter 1, the Project is a Land Use with Higher Potential Pollutant Loads (LUHPPL) because it includes a parking structure/lot with high-intensity uses of 1,000 or more daily vehicle trips. To lessen the potential impact of stormwater discharges from the LUHPPL, the long-term pollution prevention plan includes measures to eliminate or minimize discharge of water that comes into contact with parking areas that have the potential to generate high concentrations of pollutants. These measures relate to numerous operational considerations and include the following:

- good housekeeping practices;
- provisions for storing materials and waste products;
- vehicle washing controls;

- requirements for inspection and maintenance of stormwater BMPs;
- spill prevention and response plans;
- provisions for landscaping maintenance;
- requirements for storage and use of fertilizers, herbicides, and pesticides;
- pet waste management;
- solid waste management;
- snow disposal and plowing plans relative to Wetland Resource Areas;
- winter road salt and/or sand use and storage restrictions;
- street sweeping schedules;
- provisions for preventing illicit discharges to the stormwater management system;
- training requirements for personnel implementing the plan; and
- a list of emergency contacts.

In addition, the Project design minimizes the total parking area exposed to rain, snow, snow melt, and runoff.

Since the exposed parking area associated with the South Garage may generate stormwater with high concentrations of oil and grease, a water quality treatment BMP is included in the design of the closed drainage system. The water quality BMP is the Vortechs proprietary stormwater BMP, which based on the manufacturer's specifications is designed to remove approximately 84% of the average annual post-construction TSS. The system is also designed to treat one inch of runoff from the total impervious area on the post-construction Project site. MassDEP has deemed this structural BMP suitable for treating discharges from a LUHPPL. This water quality treatment will occur prior to the discharge entering the Project's recharge system, thereby satisfying the requirement to remove 44% TSS prior to discharge into the infiltration BMP.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department [DEP] to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a*

critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00.[8] Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of the public water supply.

Compliance: The Project will comply with this Standard, as the Project site does not contain Sensitive Resources and there will not be any discharge of untreated stormwater to a sensitive resource area. It is worth noting, however, that stormwater runoff from the Project area discharges into the Eastern County Ditch, which is hydraulically connected to the Rumney Marshes Area of Critical Environmental Concern (ACEC). Under existing conditions, stormwater runoff is untreated; by implementing the proposed structural and non-structural BMPs to manage and treat stormwater runoff, the Project will significantly improve the water quality of runoff discharged from the site. In compliance with MassDEP Stormwater Management Guidelines, stormwater runoff from impervious surfaces will be treated to remove at least 80% TSS prior to discharge into the Ditch. Improvements in the water quality of runoff from the Project site will also benefit the ACEC.

As described above, the Project is a Land Use with Higher Potential Pollutant Loads since it includes a parking structure/lot with high-intensity use of 1,000 or more daily vehicle trips. For a LUHPPL, the required volumetric capacity for water quality treatment is equal to one inch of runoff from the impervious area of the post-construction site, which is the same volume required for treatment of discharges to a Critical Area. As noted above, the proposed Vortechs proprietary BMP meets this standard.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

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8 If NPDES Construction General Permit or Multi-Sector General Permit is required for a discharge to an ORW, DEP must approve the Stormwater Pollution Prevention Plan (SWPPP).

Compliance: The South Garage is a redevelopment project that proposes to reduce impervious surface area by approximately 2.1% relative to the existing developed site. Since the Project is a redevelopment project, it will satisfy Stormwater Management Standards 2 and 3 to the maximum extent practicable and the pretreatment and structural BMP requirements of Standards 4, 5, and 6 (see compliance narratives specific to each individual Standard). Existing stormwater discharges will comply with Standard 1 to the maximum extent practicable. The Project will comply with other requirements of the Stormwater Management Standards (see compliance narratives below) and will improve existing conditions.

According to MassDEP, "to the maximum extent practicable" means that proponents of redevelopment projects have demonstrated three items: (1) they have made all reasonable efforts to meet the applicable Standard(s); (2) they have made a complete evaluation of possible stormwater management measures including environmentally-sensitive site design (e.g., minimizing land disturbance and impervious surface area), low impact development techniques, and stormwater BMPs; and (3) if not in full compliance with the applicable Standard(s), they are implementing the highest practicable level of stormwater management.

The South Garage Project will improve existing conditions. Stormwater controls and techniques reflected in the design will reduce the annual pollutant load originating from the site, and the expansion of pervious surface area will reduce the post-construction peak discharge rate from existing conditions. A stormwater infiltration system will further promote groundwater recharge and reduce the volume and rate of surface runoff discharging from the site.

8. *A plan to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

Compliance: The Project will comply with this Standard. Sedimentation and erosion controls are reflected in the Project design and will be employed throughout construction. Land disturbance will be kept to a minimum, and construction activities will be appropriately sequenced to ensure that only active construction areas are left exposed; other areas will have temporary cover (artificial or natural) or permanent vegetation. Permanent structures, temporary or permanent vegetation, or mulch or erosion netting will be employed as quickly as practicable following land disturbance. Erosion control and stormwater management measures will protect disturbed areas from stormwater runoff by preventing water from entering those areas as surface flow, thereby minimizing erosion and subsequent downstream sedimentation. Perimeter control practices will isolate the construction site from surrounding areas. Siltation fencing, temporary covers for drainage structures, and temporary settlement basins will be used where appropriate.

Since the Project will disturb more than one acre of land area, the Proponent will submit a Notice of Intent to the EPA for coverage under the General Permit of the National Pollution Discharge Elimination System (NPDES). That application will include a Stormwater Pollution Prevention Plan (SWPPP) that will be approved prior to land disturbance. The SWPPP, which must be kept on site, will address erosion and sedimentation controls (i.e., stabilization practices and structural practices), temporary and permanent stormwater management measures, contractor inspection schedules and reporting requirements, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges. A draft SWPPP was submitted to the Revere Conservation Commission with the Project's Notice of Intent, which received an Order of Conditions allowing the Project to proceed on June 3, 2009.

The Proponent will obtain the appropriate permits for any dewatering operations that may be required during construction, and the Contractor will be required to adhere to the stipulations and special conditions of all permits.

9. *A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

Compliance: The Project will comply with this Standard. The Proponent is committed to the proper operation and maintenance of the proposed systems that will be installed to preserve and protect the watershed and stormwater management functions. A Long-Term Pollution Prevention Plan accompanied the Proponent's Notice of Intent submittal to the Revere Conservation Commission, which received the Order of Conditions on June 3, 2009. That plan identifies long-term BMP operation requirements designed to ensure proper maintenance and ongoing function of the stormwater management system.

10. *All illicit discharges to the stormwater management system are prohibited.*

Compliance: There will be no illicit connections associated with the Project; therefore, the Project will comply with this Standard.

4.7 Soils and Hazardous Materials

There is no use restriction for a parking garage on the Project site. Prior to its existing use as surface parking, the Project site was used for various entertainment and commercial ventures. The site may contain urban fill, and if such fill is encountered during subsurface excavation for the garage foundation, the contractor will be required to comply with handling, notification, and disposal requirements. Measures will be included in the construction

contract specification package requiring that if hazardous material is found during construction, clean-up will be performed in accordance with the Massachusetts Contingency Plan (310 CMR 40.0030) and applicable DEP Policies.

The Proponent will minimize the amount of construction waste by reusing and recycling materials when possible. Since the Project will not require significant demolition beyond the removal of asphalt, most debris will be generated from packaging materials and extra scraps from raw materials (e.g., corrugated cardboard, glass, aluminum, scrap metal, cable and wire). The Proponent will encourage the construction contractor to save materials for use in other projects, return durable packaging to suppliers, and coordinate with the Institute Recycling Network to recycle smaller scraps and non-hazardous materials. For those materials that cannot be recycled, solid waste will be transported in covered trucks to an approved solid waste facility per MassDEP's Regulations for Solid Waste Facilities (310 CMR 16.00).

4.8 Ecologically Sensitive Areas and Endangered Species

There are no federally-listed threatened or endangered species on the Project site. There will be no impacts, and no mitigation is required.

The Massachusetts Natural Heritage Atlas, 13th Edition (effective October 1, 2008) does not identify state-mapped Priority Habitat of Rare Species, Estimated Habitat of Rare Wildlife, or Vernal Pools on or near the Project site.

4.9 Visual Characteristics and Impacts

Consistent with the Project's sustainable design goals, lighting will be designed to eliminate light trespass onto adjacent areas. Lighting systems will provide adequate illumination for public safety while minimizing impacts on night-sky visibility. Consistent with the approach outlined in the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) Guidelines for Light Pollution Reduction, the following strategies will be employed:

1. Lighting systems will be designed by a qualified lighting designer to ensure that an environmentally-sensitive approach satisfies Project requirements;
2. Lighting design will be appropriate for the neighborhood;
3. Lighting design will be balanced to minimize fixtures while providing the appropriate quantity of light;
4. Lighting specifications will consider fixture selection to reduce glare and increase performance;
5. Exterior lighting will be designed to minimize upward illumination;
6. Automated systems will reduce unnecessary lighting.

4.10 Energy

To promote energy self-sufficiency, a roof-mounted photo-voltaic array is included in the Project design. The Proponent expects the 20,000-square-foot photo-voltaic array to generate approximately 200 KW. This energy production is anticipated not only to be sufficient to power the South Garage but also to produce a surplus. To minimize electricity use in Project construction and operation, the Project will use recyclable construction materials and will incorporate energy-efficient lighting and design techniques to maximize natural lighting. Lighting systems will incorporate automatic controls designed to reduce energy use and maximize energy efficiency; photocell dimming, for example, will reduce perimeter lighting when daylight provides adequate illumination. Lighting within the structure and throughout the site will be equipped with photocells or timers or both to minimize energy use.

Additional features are provided in the Project design and function to promote sustainability and energy efficiency. Parking spaces will be designated for carpools, vanpools, and car-sharing programs, and the South Garage will include infrastructure for electric cars. Secure bicycle storage will also be provided to encourage bicycle travel to and from the Project site. In the aggregate, these measures will encourage users of Wonderland Station and adjacent areas to embrace not only public transit options but also alternative modes of transit that will reduce single-occupancy vehicle trips.

4.11 Historic Resources and Parklands

The Project site is paved and currently used as a parking lot. It contains no historic resources, but is in the vicinity of properties included in the National Register of Historic Places.

National Register-listed historic properties and districts in the vicinity of the parcel include the Revere Beach Reservation Historic District (MHC# REV.B), located to the east of the Project site, which is also a National Historic Landmark. The reservation encompasses several individual structures that contribute to the significance of this National Historic Landmark district, including the Metropolitan District Commission Police Station/Revere Beach Police Station (MHC # REV.31), the Revere Beach Reservation Bath House Pavilions (REV.924), and the Revere Beach Reservation Revere Street Pavilions (REV.905), as well as a portion of Revere Beach Boulevard.

Two parkways located southwest of the Project site – the Revere Beach Parkway and the Winthrop Parkway – are listed in the National Register of Historic Places as part of the Metropolitan Parkway System of Greater Boston Multiple Property Submission.

Properties listed in the National Register of Historic Places within a quarter-mile radius of the Project site are depicted on Figure 4-13 (National Historic Resources) and listed in Table 4-11.

Table 4-11 Historic Resources near the Project site (see Figure 4-13)

No.	Name	Address	Distance from Project site
National Register Listed Properties and Districts			
A	Revere Beach Reservation National Historic Landmark District	Eliot Circle to Northern Circle	~500 feet
B	Revere Beach Parkway		~400 feet
C	Winthrop Parkway		~200 feet

4.11.1 Design and Visual Impacts to Historic Resources

The design of the garage is consistent with the height, scale, and massing of similar developments along Ocean Avenue to the northeast and southeast. Visually, the garage will be largely obscured from the Revere Beach Reservation by existing residential development east of the Project site. From viewpoints on the beach, the garage structure has been situated almost directly behind existing high-rise development, minimizing its visibility. Elements of the South Garage that will be most visible from Revere Beach will include the glass-enclosed elevators, which will create a visual cue associated with garage access while also enhancing safety and security by providing visibility into the elevator cabs.

The MBTA South Garage is designed to be consistent with its urban context and will:

- Establish clear, direct, and handicapped-accessible pedestrian connections to the MBTA Wonderland Station;
- Provide a safe, pedestrian-friendly environment;
- Use appropriate landscaping and paving materials to connect with neighboring areas;
- Promote MBTA ridership by activating the area with information about MBTA services and schedules; and
- Provide a modern parking facility that also achieves green building goals.

The Project will not have any adverse visual impacts on historic resources.

4.11.2 Shadow Impacts

The Project will not cast any shadow on the Revere Beach Reservation, Revere Beach historic structures, the Revere Beach Boulevard, or the beach itself. There will be no new shadows cast upon any other historic properties listed on the National Register of Historic Places.

The Project will not have any shadow impacts on historic resources.

4.11.3 Archaeological Resources

The existing Project site is paved and currently used as a surface parking lot. A review of the site history and Sanborn maps indicates that by the mid-twentieth century portions of the site were developed for a variety of uses including a filling station, restaurant, furniture manufacturing facility, and recreation hall.

A review of the Inventory indicates there are no previously identified archaeological resources within the Project site.

Due to previous development activities and disturbance, it is anticipated that the site is unlikely to contain any intact archaeological resources.

4.12 Environmental Justice

The South Garage Project is immediately adjacent to an area defined by the Boston Metropolitan Planning Organization (MPO) as an environmental justice Traffic Analysis Zone (TAZ) and is within an environmental justice area as defined by Environmental Protection Agency standards and Massachusetts Executive Office of Energy and Environmental Affairs standards using U.S. Census data (see Figure 4-14 [Environmental Justice Area]). Environmental justice issues typically arise when environmental impacts disproportionately affect minority or low-income communities, which may occur when a proposed action is located in an area where there is a high concentration of those populations. No anticipated adverse environmental impacts are associated with this Project, and the proposed Project will provide a safer and more accessible public transit system for the entire community.

The City of Revere encompasses 10 square miles, 40% of which are water and wetlands, and is a multi-ethnic inner suburb of 55,341 residents with significant needs. As of March 2009, the unemployment rate of 8.5% matched the national rate but exceeded the overall Massachusetts rate (7.8%). Revere typically has the third-highest unemployment rate of Commonwealth municipalities within Route 128, and the City is at the center of the Chelsea-Lynn-Revere area which leads the Boston MPO in high unemployment. In terms of residents living below the poverty line, Revere's rate of 14.6% exceeds the state (9.3%) and national (12.4%) rates per the 2000 Census. Revere's average per capita income ($19,698) and median household income ($37,067) are both below state and national figures.

Demographically, 25.4% of Revere residents are foreign-born[9], with 36.3% of persons five years or older speaking a language other than English at home. In the 2006-07 school year, 42% of students in Revere Public Schools (RPS) did not speak English as their first language. System-wide, 63% of RPS students are low-income. Nearly two-thirds (62.6%) of students at the Garfield Middle School, the neighborhood middle school nearest the Project site, do not speak English as their first language and 82.4% are classified as low-income.[10]

Revere's challenging socioeconomic conditions have strengthened local government and community support for the South Garage Project as an important step toward transforming the existing area of surface parking lots into more productive uses. The Project seeks to capitalize on the site's proximity to public transit and natural features such as Revere Beach, to reinvigorate the area. By improving transit options, enhancing accessibility to public resources, and improving safety and the appeal of the area, the Project will lay an effective foundation for economic development and other efforts that will further activate the area, create accessible jobs, and strengthen the City's tax base. In summary, the South Garage is a key piece of infrastructure to support community livability. This Project will benefit the environmental justice community by attracting employment and entrepreneurship opportunities, improving transit access for multiple users (including cyclists and pedestrians), and eliminating the blight of acres of asphalt parking lots by providing a new MBTA-controlled parking supply that will enable the development of adjacent non-MBTA-controlled surface lots.

4.13 Safety and Security

A number of factors are important to consider as part of the Project design and operational specifications to promote safe and secure use. These factors will interface with facilities management, personnel management, and emergency services communications systems to collectively form the security system for the Project site.

4.13.1 Lighting

Artificial and natural lighting will provide sufficient visibility in the South Garage and throughout the Project site to provide for safe passage of vehicles and pedestrians alike. Adequate lighting will also make it more difficult for unlawful activity to go undetected by minimizing shadowed locations; the level of lighting will be compatible with video surveillance systems. Intelligent use of materials and lighting will contribute to a favorable level of safety at the South Garage.

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9 Source: 2005-2007 American Community Survey, US Census

10 Source: 2006-07 Revere School Report Card

4.13.2 Signage

Signs will be strategically located to effectively assist people unfamiliar with a facility. Signs will direct public users to proper areas of the building, warn against unauthorized entry into nonpublic spaces, and indicate emergency evacuation routes and the locations of exits, fire alarms, and police call boxes. All signs used at the South Garage, including signs directing users to the adjacent Wonderland Station, will be legible and easily discernable by commuters and other users, including those with disabilities. Emergency exit signs will be equipped with lighting elements to make them visible in the dark.

4.13.3 Crime Prevention through Environmental Design

The concept of crime prevention through environmental design has evolved as a means to reduce opportunities for crimes to occur. Physical design features will discourage crime while encouraging legitimate use of the environment by employing elements of defensible space, surveillance, lighting, landscaping, and physical security planning. The South Garage will consolidate parking within the controlled space of a vertical structure where visibility and the level of activity will exceed such conditions in the existing surface parking lots. Appropriate lighting, signage, and surveillance will further deter crime and promote public safety.

4.14 Construction

The South Garage Project will provide numerous benefits, and throughout construction commuters will have sufficient parking and access to ongoing MBTA operations. MBTA bus and Blue Line services will not be interrupted during construction. The Proponent will require the construction contractor to maintain safe pedestrian pathways, commuter parking, and access to Wonderland Station, with minimal need for pedestrians to cross active construction zones. Fencing will separate the construction zone from transit-related activity at Wonderland Station. Figure 4-15 (Construction-Period Access to Wonderland Station) illustrates how MBTA customers will access Wonderland Station during construction of the South Garage.

4.14.1 Construction-Period Safety and Security

Project construction will comply with local, state, and federal codes and regulations governing pedestrian protection and relevant safety standards. Since construction will not impede ongoing operations at Wonderland Station, pedestrians will continue to walk between parking areas and the MBTA station. To accommodate this condition, the Proponent will maintain clearly-marked and delineated pedestrian routes and construction laydown areas to ensure safe and efficient pedestrian passage through the site. These pathways will be well lit, well marked, and conveniently located.

4.14.2 Construction-Period Transportation Management Plan

Several measures are included in the transportation management plan to minimize impacts to the transportation system during Project construction. Implementing these measures will maintain safe and efficient access to the Project site and adjacent facilities throughout the construction period, as summarized below.

- Designated truck routes will govern truck access to the Project site, limiting construction trucks to use of the regional highway system (Route 1A) and Revere Street and avoiding residential city streets to the extent practical.

- Secure fencing and sidewalk staging protection will separate pedestrian and vehicular traffic from active construction areas.

- Secure on-site storage for tools and equipment will minimize construction-related vehicle trips.

- Full or partial street closures will be avoided to the extent possible. Should a partial street closure be necessary to, for example, off-load materials or complete construction-related activities, the impact to vehicular and pedestrian flows will be minimized by limiting the closure to off-peak periods as defined by MassHighway, the MBTA, and the City of Revere. Police details will be used as required. The contractor will submit a traffic and pedestrian management plan to MassHighway, the MBTA, and the City for review and approval prior to construction.

- During construction, an on-site MBTA police detail will manage pedestrian and construction vehicle traffic.

- The Proponent will coordinate with MassHighway, the MBTA, and the City of Revere regarding transportation-related construction impacts of the Project.

- Limited construction worker parking will be available at nearby parking facilities, but construction workers will be prohibited from parking along adjacent roadways. Furthermore, construction contractors will be encouraged to subsidize the purchase of MBTA Charlie Cards for qualified employees to the extent allowable under Internal Revenue Service regulations to encourage use of public transportation and reduce traffic and parking demands.

4.14.3 Construction-Period Air Quality

Short-term air quality impacts from fugitive dust may be expected during early phases of construction including parking lot removal and subsequent excavation. Plans for controlling fugitive dust include mechanical street sweeping operations, wetting portions of

the site during windy conditions, and removing debris from the site in covered trucks. The construction contract will include a range of strictly enforced measures for contractors to reduce potential emissions and minimize impacts. These measures are expected to include:

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing storage of spoils on the construction site;
- Monitoring construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on the site; and
- Periodically washing down streets and sidewalks to minimize dust accumulations.

4.14.4 Construction Noise

The Proponent is committed to minimizing and mitigating noise impacts from Project construction. Sound generation above background levels, however, is a typical consequence of construction activities. The types of equipment used during construction will include excavators, dump trucks, drilling rigs, saws, cranes, jackhammers, welding equipment, small power tools, and generators.

The FTA noise manual presents a method for calculating one-hour L_{eq} for a general assessment of construction noise. Inputs include equipment-specific reference sound levels at a distance of 50 feet (Table 12-1 of the FTA manual) from the center of the Project to residential property. For a detailed assessment, ground effects and a usage factor (which accounts for the fraction of time the equipment is in use over the specified period of time) are also used; however, for the general assessment ground effects are assumed minimal and usage factor is assumed to be 100%. The distance from the center of the Project to the nearest residential property (located to the east) is 210 feet.

The FTA general assessment method compares the combined one-hour noise level from the two noisiest pieces of equipment, assuming they both operate at the same time, to one-hour L_{eq} values at residential land. The FTA general assessment method requires identification of residential properties where the combined one-hour L_{eq} exceeds 90 dBA during day and 80 dBA during night. The two pieces of equipment with the highest one-hour L_{eq} are dump trucks (L_{eq} = 76 dBA) and jackhammers (L_{eq} = 76 dBA), and the combined one hour L_{eq} is 79 dBA. Therefore, there are no residential properties in which the one-hour combined L_{eq} from the two noisiest pieces of equipment exceeds 80 dBA.

Every reasonable effort will be made to minimize the noise impact of construction activities. Mitigation measures are expected to include the following:

- Using appropriate mufflers on construction equipment and ongoing maintenance of intake and exhaust mufflers;
- Installing muffling enclosures on continuously running construction equipment, such as air compressors and welding generators;
- Using construction operations, equipment, and techniques that generate relatively less noise, where feasible;
- Scheduling construction equipment operations to synchronize the noisiest activities with times of highest ambient sound levels and to maintain relatively uniform auditory conditions, when feasible;
- Turning off idling construction equipment;
- Staging relatively noisy construction equipment where physical shields or distance protect sensitive receptors, where feasible; and
- If complaints occur, placing temporary walls (or other physical shields) between noisy activities and noise-sensitive receivers.

4.14.5 Construction Waste Management

The Proponent will minimize the amount of construction waste generated through reuse and recycling methods. Since the Project will not require significant structural demolition, the amount of generated waste will be less than for many comparably-sized projects. Most construction debris and solid waste will be generated from packaging materials and extra scraps when raw materials are cut or sized (such as corrugated cardboard, glass, aluminum, scrap metal, cable and wire). To minimize waste, the Proponent will encourage the construction contractor to take steps such as saving large scraps for use in other projects, returning durable packaging to suppliers, and source separating and recycling smaller scraps and non-hazardous materials.

The Institute Recycling Network will be contacted to coordinate the recycling of construction materials. Solid waste that cannot be recycled will be transported in covered trucks to an approved solid waste facility per MassDEP's Regulations for Solid Waste Facilities (310 CMR 16.00).

Section 5.0

Regulatory Review, Comments and Coordination

5.0 REGULATORY REVIEW, COMMENTS AND COORDINATION

The Project's review under the Massachusetts Environmental Policy Act, M.G.L. c. 30, §§ 61 through 62H, inclusive (MEPA) has been completed; the Secretary of the Executive Office of Energy and Environmental Affairs issued a Certificate on the Final Environmental Impact Report (FEIR) on May 15, 2009, finding that the FEIR complied with MEPA.

The Project received an Order of Conditions from the Revere Conservation Commission on June 3, 2009 in accordance with the Massachusetts Wetlands Protection Act.

Agency coordination and community outreach are also discussed in Section 1.4.

5.1 EA Scoping

On June 4, 2009, a meeting was held at the office of the MBTA to establish the scope for the Project's Environmental Assessment. The following agencies and persons participated in the meeting:

State Agencies

Andrew Brennan, Massachusetts Bay Transportation Authority

Holly Palmgren, Massachusetts Bay Transportation Authority

Project Management & Cost (PM&C), Consultant to Eurovest Development, Inc.

Peter Bradley

Consultants to PM&C

Holly Carlson, Epsilon Associates, Inc.

Elizabeth Grob, Epsilon Associates, Inc.

Laura Rome, Epsilon Associates, Inc.

5.2 List of Agencies and Persons Consulted

Since mid-2007, throughout the planning for this Project, the Proponent has held monthly meetings with the City of Revere to discuss design, schedule, programming, and construction logistics. Mayor Thomas Ambrosino has been personally involved in those meetings and remains an integral part of the Project team. Due to this degree of coordination with the City, the community's interests and concerns are directly reflected in the Project proposal.

During the Notice of Intent public hearing process in May 2008, the public and the Revere Conservation Commission had an opportunity to provide comments on the application. The MassDEP Wetlands and Waterways Division also reviewed the Notice of Intent application at that time.

Name	Affiliation	Location (MA)
Federal		
Peter Butler	Federal Transit Administration	Cambridge
Richard Doyle	Federal Transit Administration	Cambridge
State		
	Massachusetts Department of Transportation – Highway Division (formerly known as Executive Office of Transportation/MA Highway Department)	Boston
Lisa McKee	Executive Office of Housing and Economic Development	Boston
Victoria Maguire		
Local		
Mayor Thomas Ambrosino	City of Revere	Revere
Douglas McGarrah	Foley Hoag LLP (Consultant to the City of Revere)	Boston
Paul Rupp	CR Associates (Consultant to the City of Revere)	Swampscott
Andrew B. DeSantis, Chair	Revere Conservation Commission	Revere

5.3 Public Comment

The proposed action will be publicized by public notice in a local newspaper and will be made available to the public at Revere City Hall. A 30-day comment period will follow publication of the notice pursuant to 23 CFR 711.121(f). If no substantive comments are received, the Draft EA will become final, and this initial public notice will also serve as the final public notice. Substantive comments will be addressed as appropriate in the final documents.

Figures

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MBTA South Garage at Wonderland Station Revere, MA

Epsilon Associates Inc.

Figure 1-1
Aerial Locus Map

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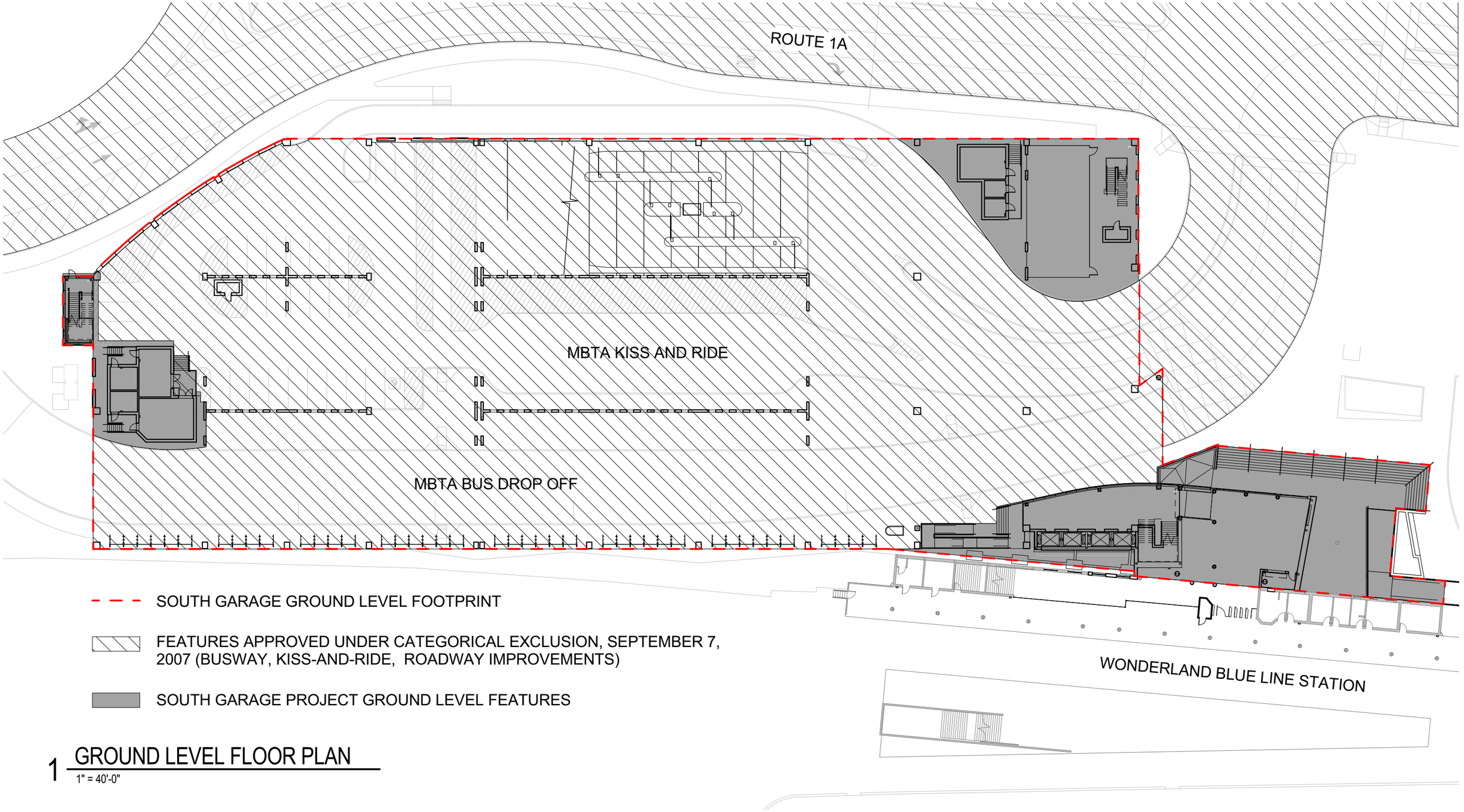

SOUTH GARAGE GROUND LEVEL FOOTPRINT

FEATURES APPROVED UNDER CATEGORICAL EXCLUSION, SEPTEMBER 7, 2007 (BUSWAY, KISS-AND-RIDE, ROADWAY IMPROVEMENTS)

SOUTH GARAGE PROJECT GROUND LEVEL FEATURES

1 GROUND LEVEL FLOOR PLAN
1" = 40'-0"

6/26/2009 11:02:40 AM

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Architecture Urban Design Planning Graphics and Interiors
212 Elm Street Somerville, MA 617.623.5555 www.arrowstreet.com

Figure 1-2

MBTA SOUTH GARAGE

Wonderland MBTA Station
1300 North Shore Rd
Revere, MA

GARAGE GROUND FLOOR PLAN

JUNE 25, 2009

1" = 40'-0"

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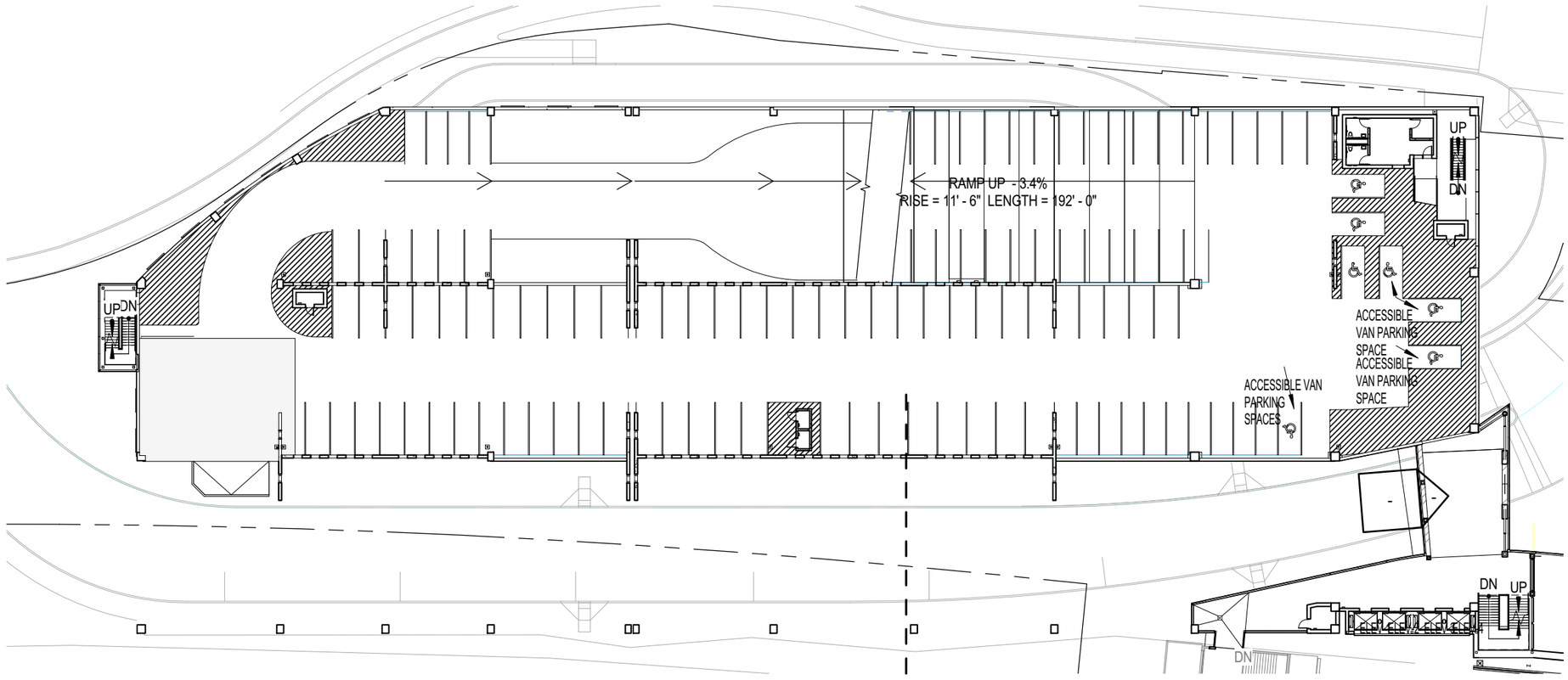

1 SECOND LEVEL FLOOR PLAN
1" = 40'-0"

6/25/2009 4:37:01 PM

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Figure 1-3

MBTA SOUTH GARAGE

Wonderland MBTA Station
1300 North Shore Rd
Revere, MA

GARAGE LEVEL 2 PLAN

JUNE 25, 2009

1" = 40'-0"

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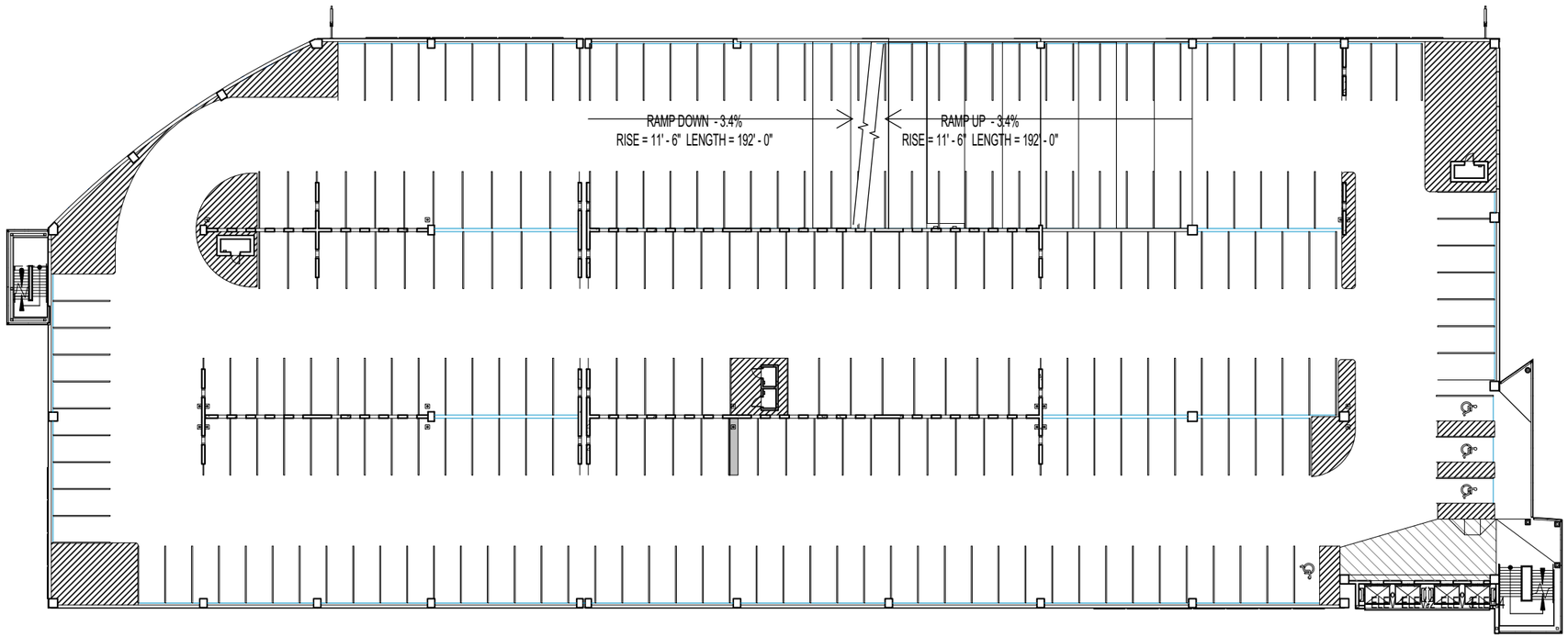

1 TYPICAL GARAGE LEVEL PLAN (LEVELS 3-7)
1" = 40'-0"

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Figure 1-4

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MBTA SOUTH GARAGE

Wonderland MBTA Station
1300 North Shore Rd
Revere, MA

TYPICAL GARAGE LEVEL PLAN (LEVELS 3-7)

JUNE 25, 2009

1" = 40'-0"

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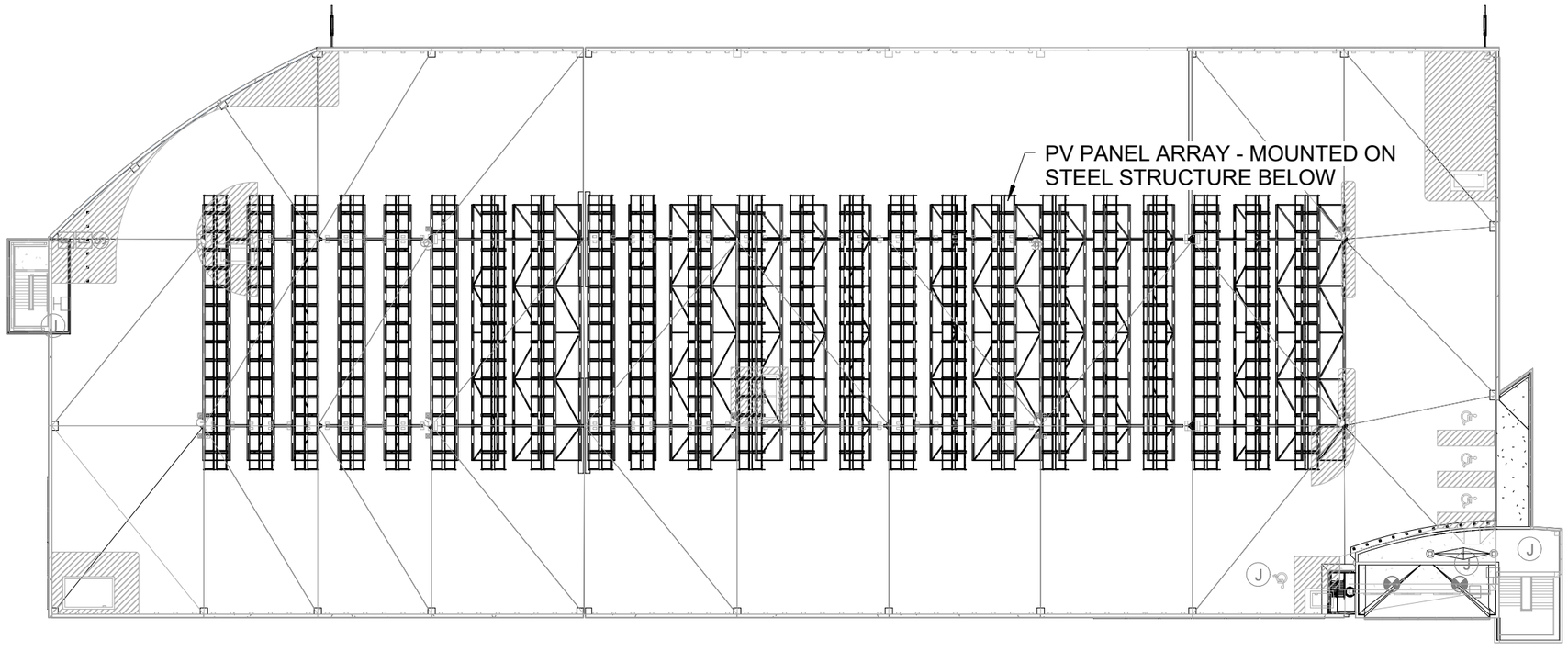

1 GARAGE ROOF LEVEL
1" = 40'-0"

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Figure 1-5

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Architecture Urban Design Planning Graphics and Interiors

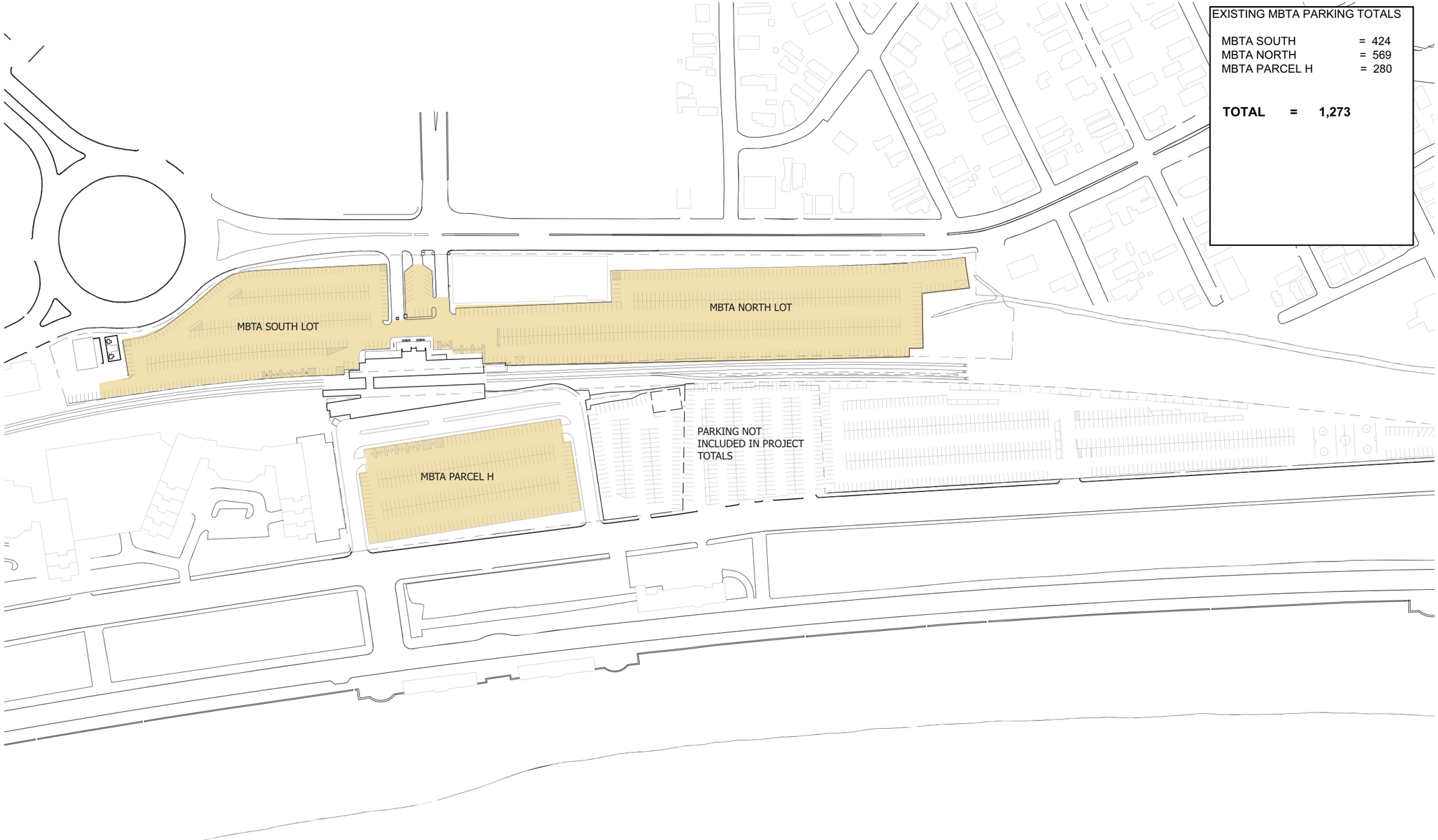
MBTA SOUTH GARAGE

Wonderland MBTA Station
1300 North Shore Rd
Revere, MA

GARAGE ROOF PLAN

JUNE 25, 2009

1" = 40'-0"



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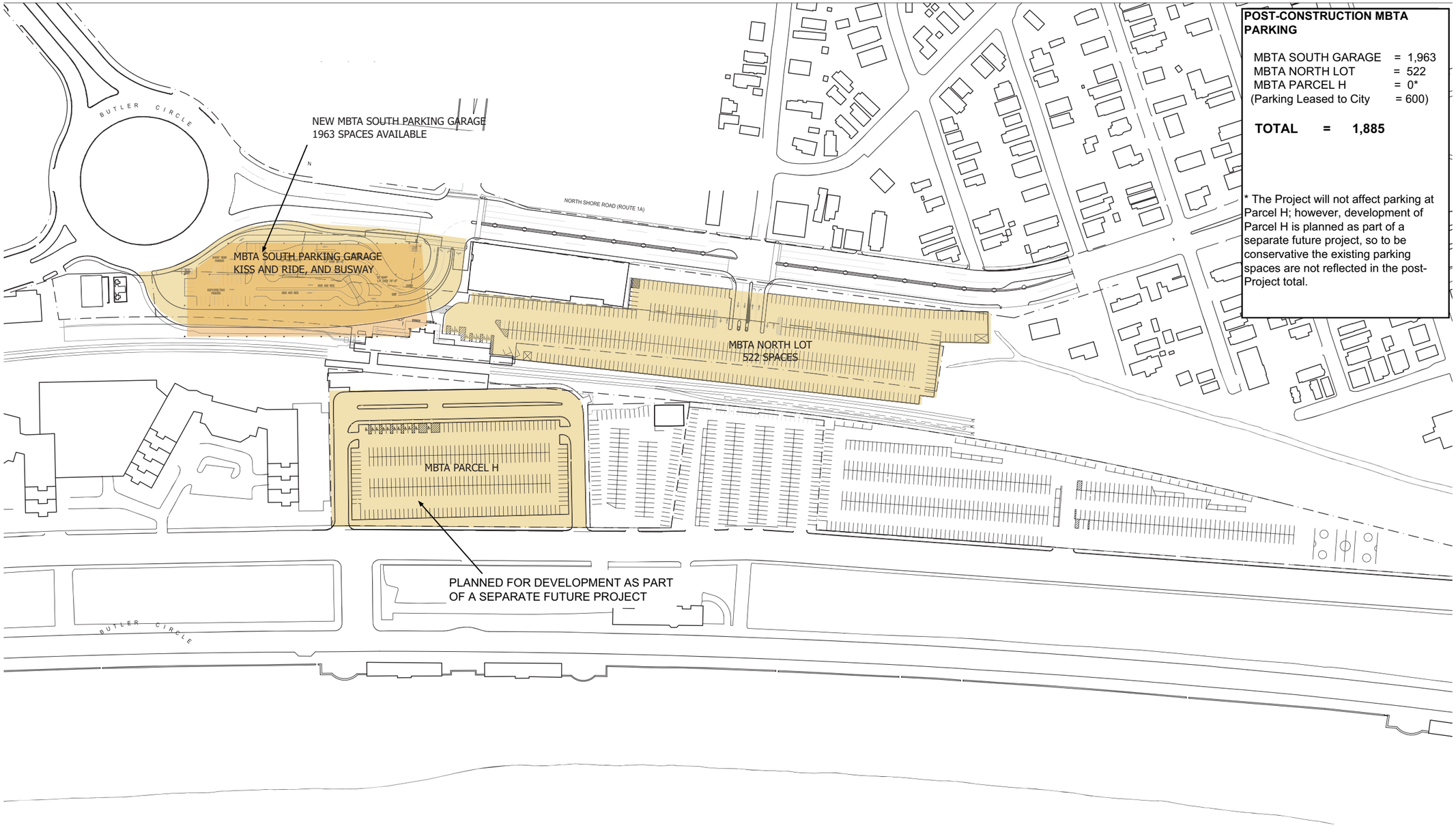
Scale: 1:80

February 2009

AST NO: 06026.01

MBTA South Garage Project
Revere, Massachusetts
Figure 1-6 Existing Parking Supply

EUROVEST DEVELOPMENT INC



POST-CONSTRUCTION MBTA PARKING

MBTA SOUTH GARAGE	= 1,963
MBTA NORTH LOT	= 522
MBTA PARCEL H	= 0*
(Parking Leased to City	= 600)
TOTAL	**= 1,885**

* The Project will not affect parking at Parcel H; however, development of Parcel H is planned as part of a separate future project, so to be conservative the existing parking spaces are not reflected in the post-Project total.

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0 20 40 80 160

Scale: 1:80

February 2009

AST NO: 06026.01

MBTA South Garage Project
Revere, Massachusetts
Figure 1-7 Post-Construction Parking Supply

EUROVEST DEVELOPMENT INC.

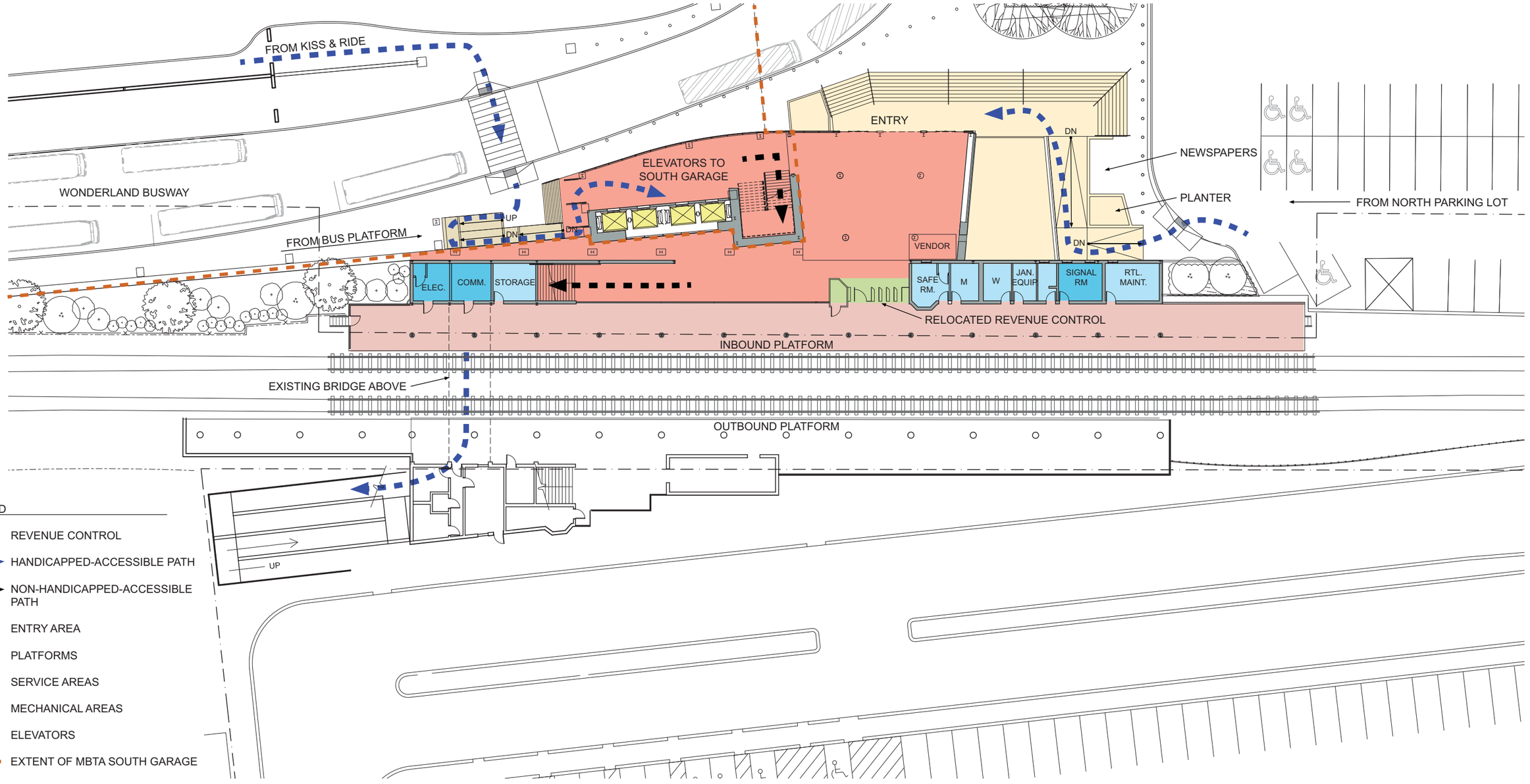

Figure 2-1 Post-Construction Access to Wonderland Station

0 8' 16' 32'

N

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EUROVEST DEVELOPMENT

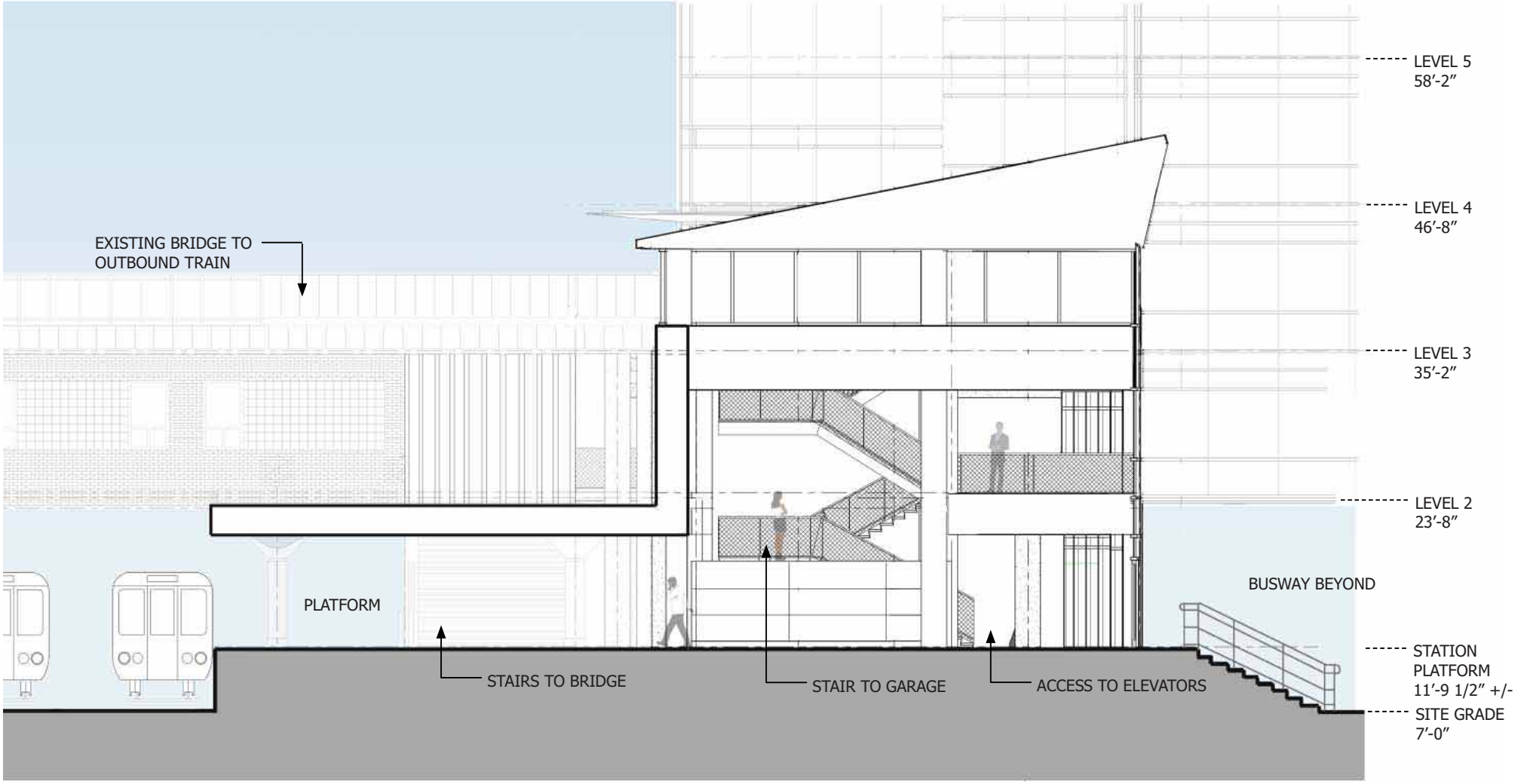

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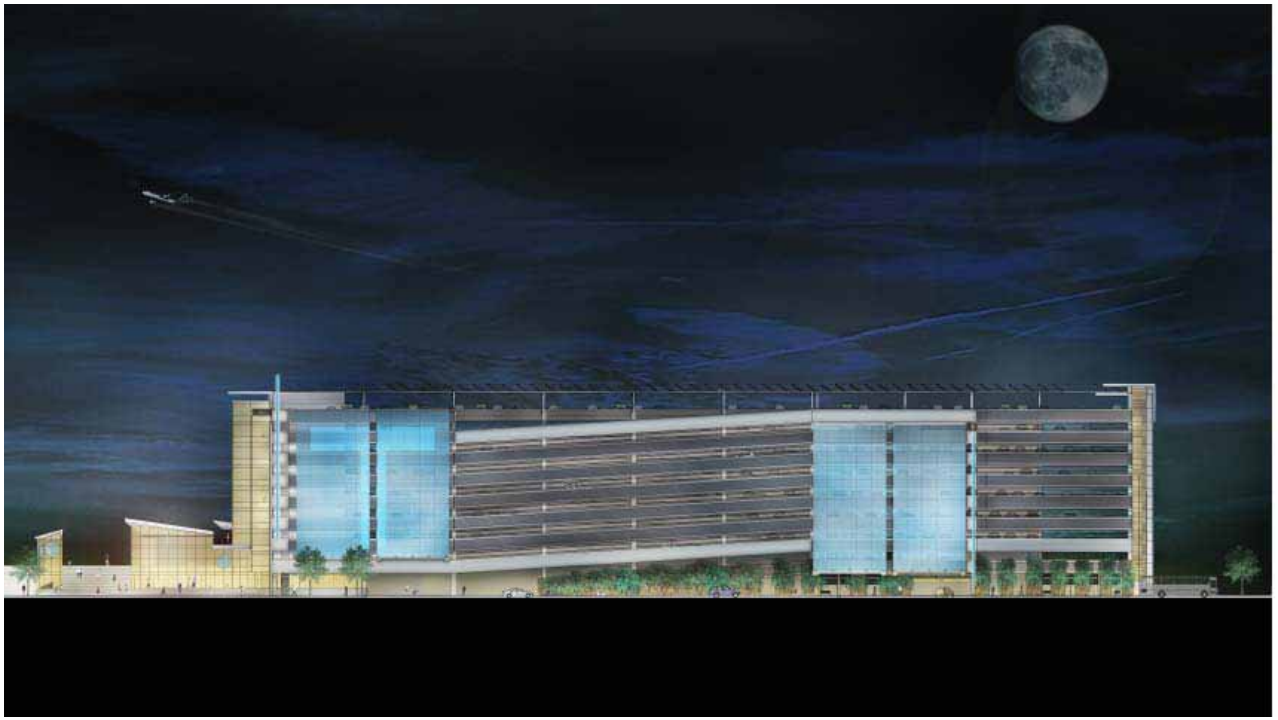
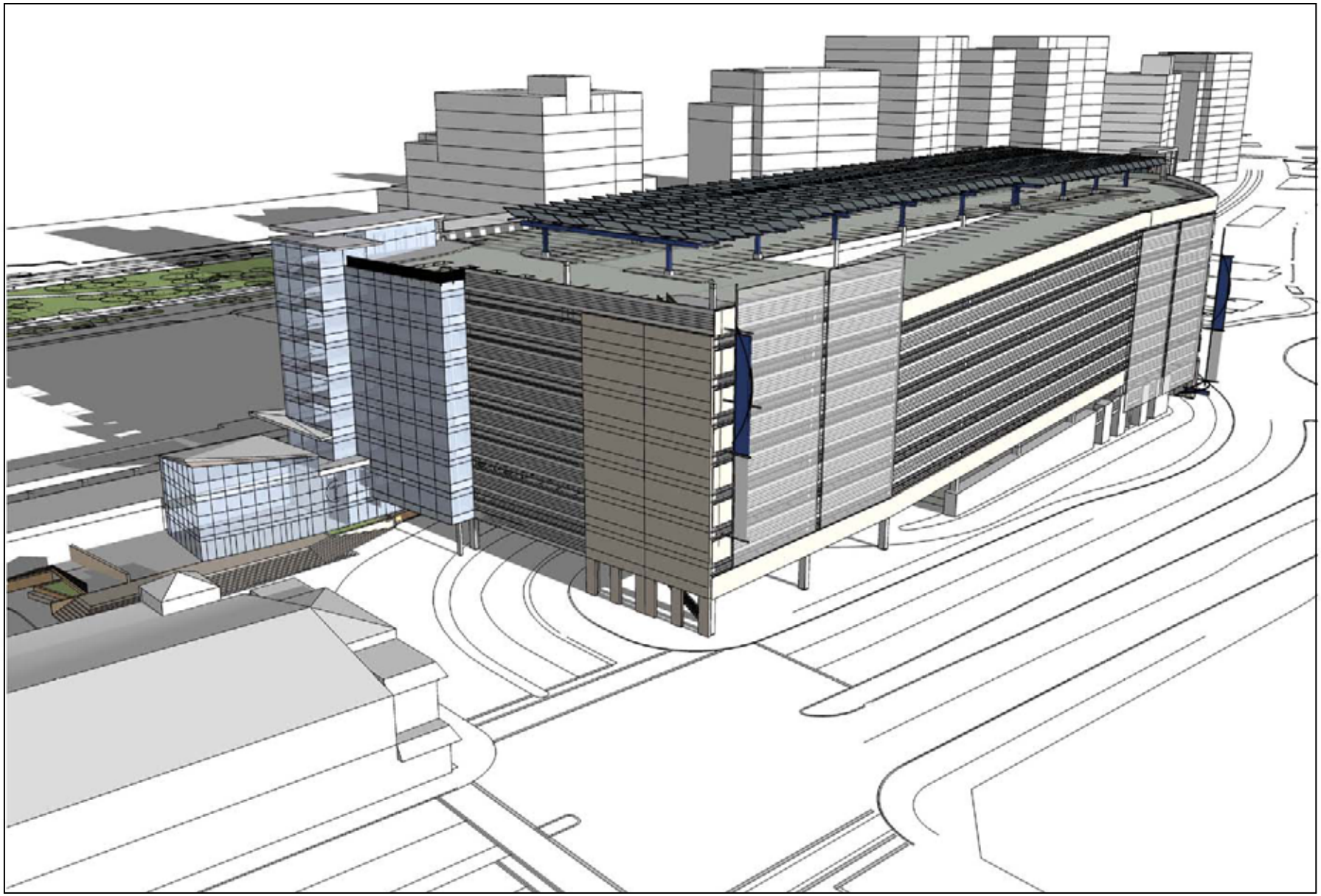
Figure 2-2 Station Building Section

MBTA Wonderland Station
South Parking Garage
2009 June 09

0 4 8

EUROVEST DEVELOPMENT INC.



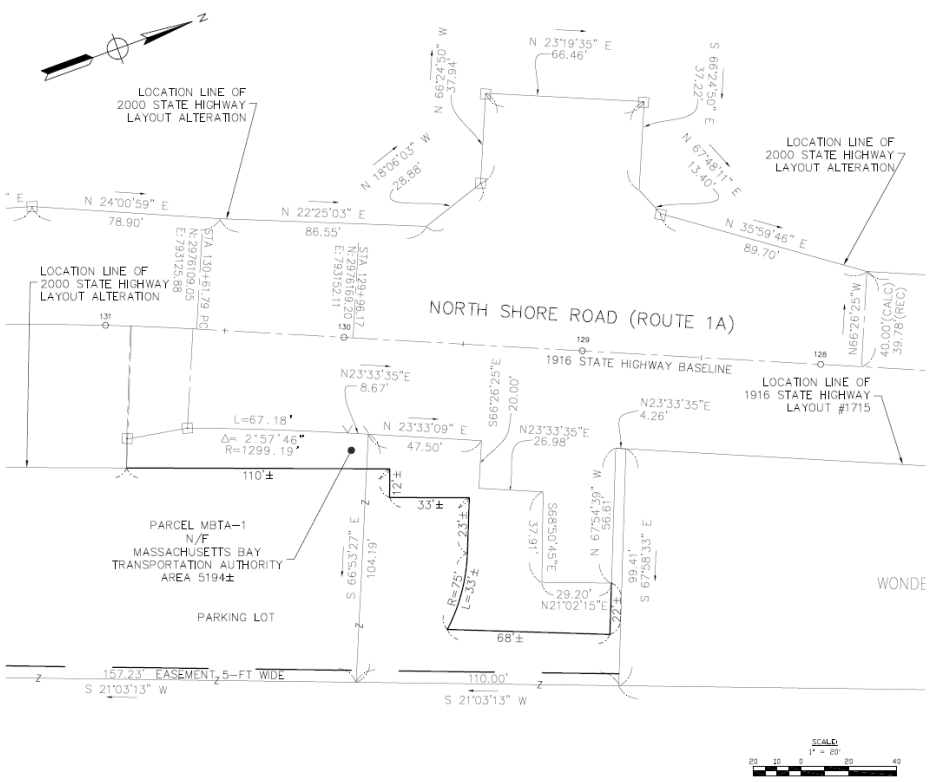


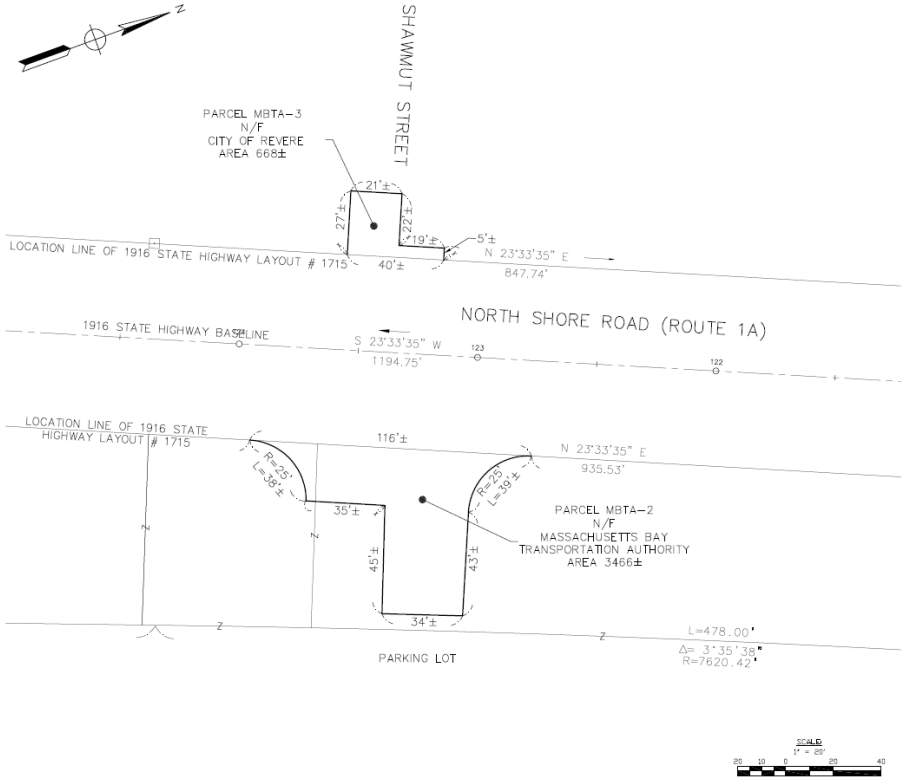
MBTA South Garage Revere, Massachusetts

Epsilon ASSOCIATES INC.

Figure 2-4

South Garage Rendering





South Garage at Wonderland Station, Revere, Massachusetts

Figure 2-5

Taking for State Highway Layout

Figure 4-1

Public Transportation System

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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Figure 4-2

Bicycle Facilities Map

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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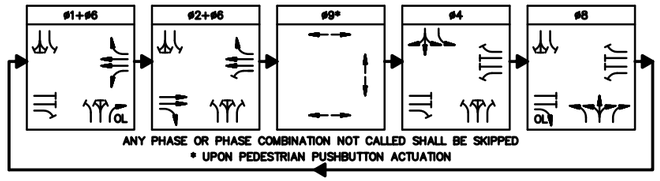
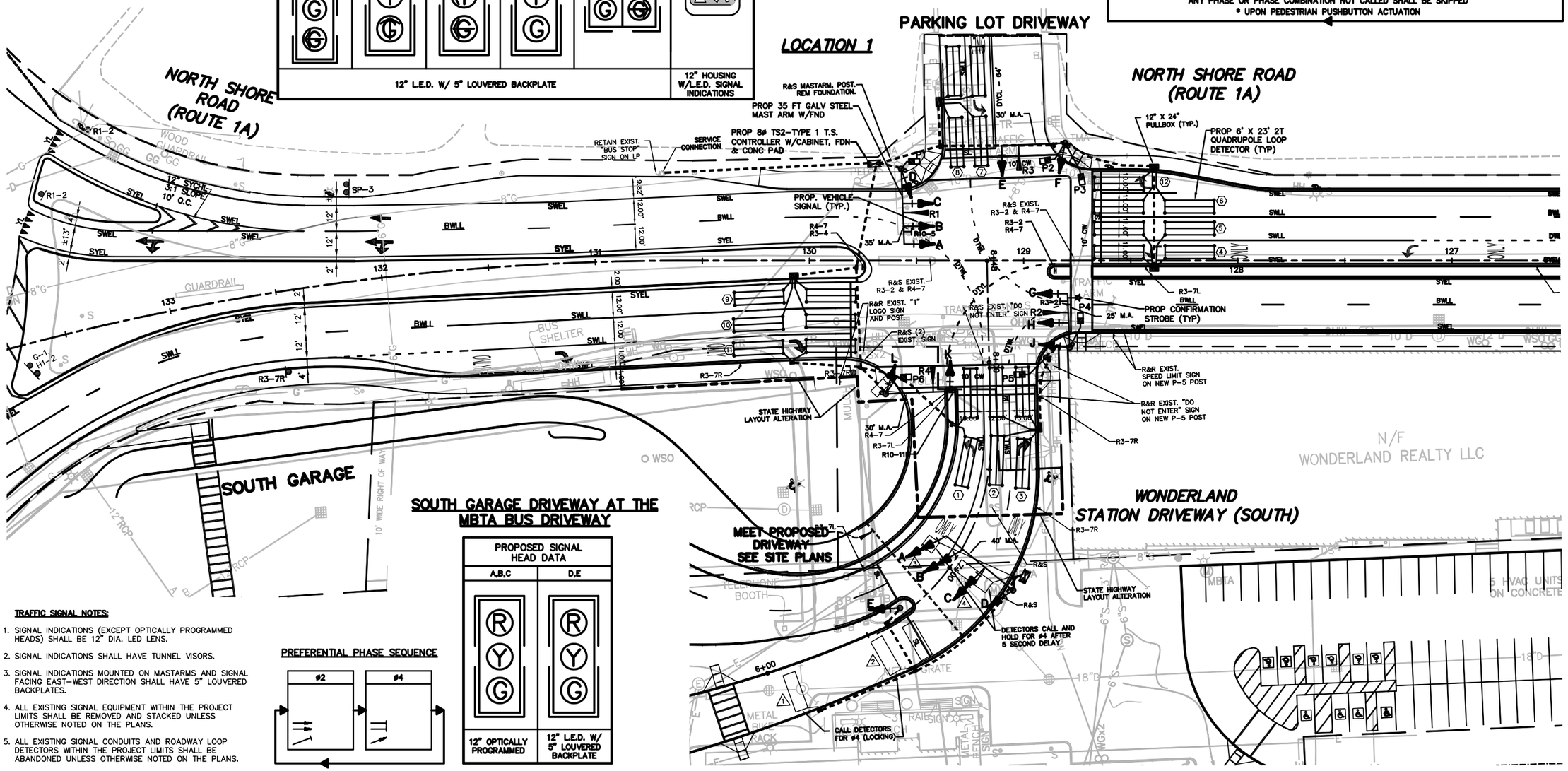
ROUTE 1A AT THE WONDERLAND STATION DRIVEWAY (SOUTH)

PROPOSED SIGNAL HEAD DATA					
D,K	G	A	B,C,E,H,L	F,J	P1–P6
12" L.E.D. W/ 5" LOUVERED BACKPLATE					12" HOUSING W/L.E.D. SIGNAL INDICATIONS

PREFERENTIAL PHASE SEQUENCE





TRAFFIC SIGNAL NOTES:

1. SIGNAL INDICATIONS (EXCEPT OPTICALLY PROGRAMMED HEADS) SHALL BE 12" DIA. LED LENS.
2. SIGNAL INDICATIONS SHALL HAVE TUNNEL VISORS.
3. SIGNAL INDICATIONS MOUNTED ON MASTARMS AND SIGNAL FACING EAST–WEST DIRECTION SHALL HAVE 5" LOUVERED BACKPLATES.
4. ALL EXISTING SIGNAL EQUIPMENT WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL EXISTING SIGNAL CONDUITS AND ROADWAY LOOP DETECTORS WITHIN THE PROJECT LIMITS SHALL BE ABANDONED UNLESS OTHERWISE NOTED ON THE PLANS.

SOUTH GARAGE DRIVEWAY AT THE MBTA BUS DRIVEWAY

PROPOSED SIGNAL HEAD DATA	
A,B,C	D,E
12" OPTICALLY PROGRAMMED	12" L.E.D. W/ 5" LOUVERED BACKPLATE

PREFERENTIAL PHASE SEQUENCE

0 25 50 Scale In Feet

Figure 4-3

Conceptual Improvement Plan
Route 1A at the Wonderland Station/
Wonderland Park Driveways

Vanasse & Associates, Inc.
Transportation Engineers & Planners

T:\5465\CAD\v3-25%\5465 Traffic Plan v3.dwg 7/2/2009 5:27:25 PM EDT

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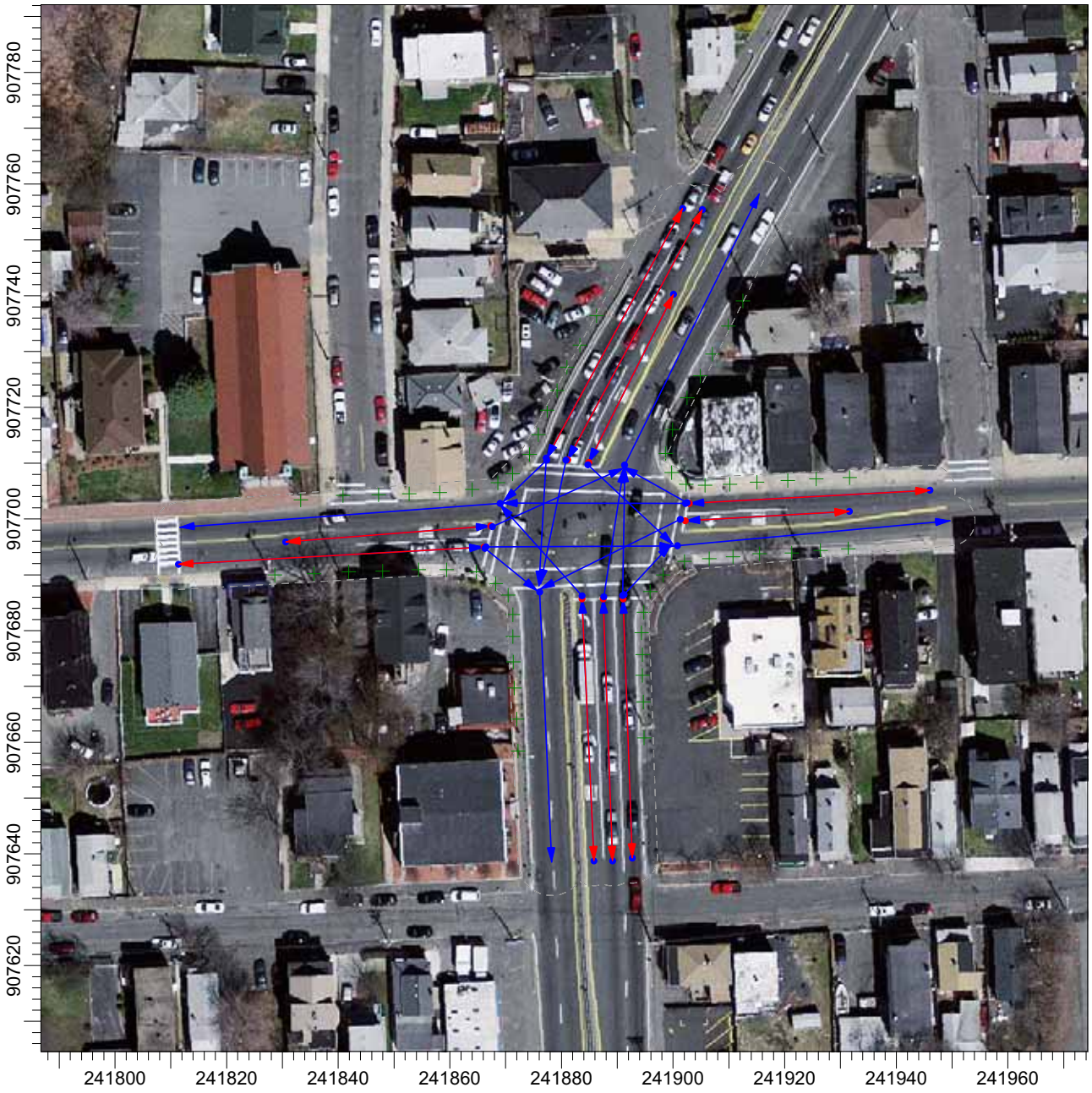
PROJECT TITLE:

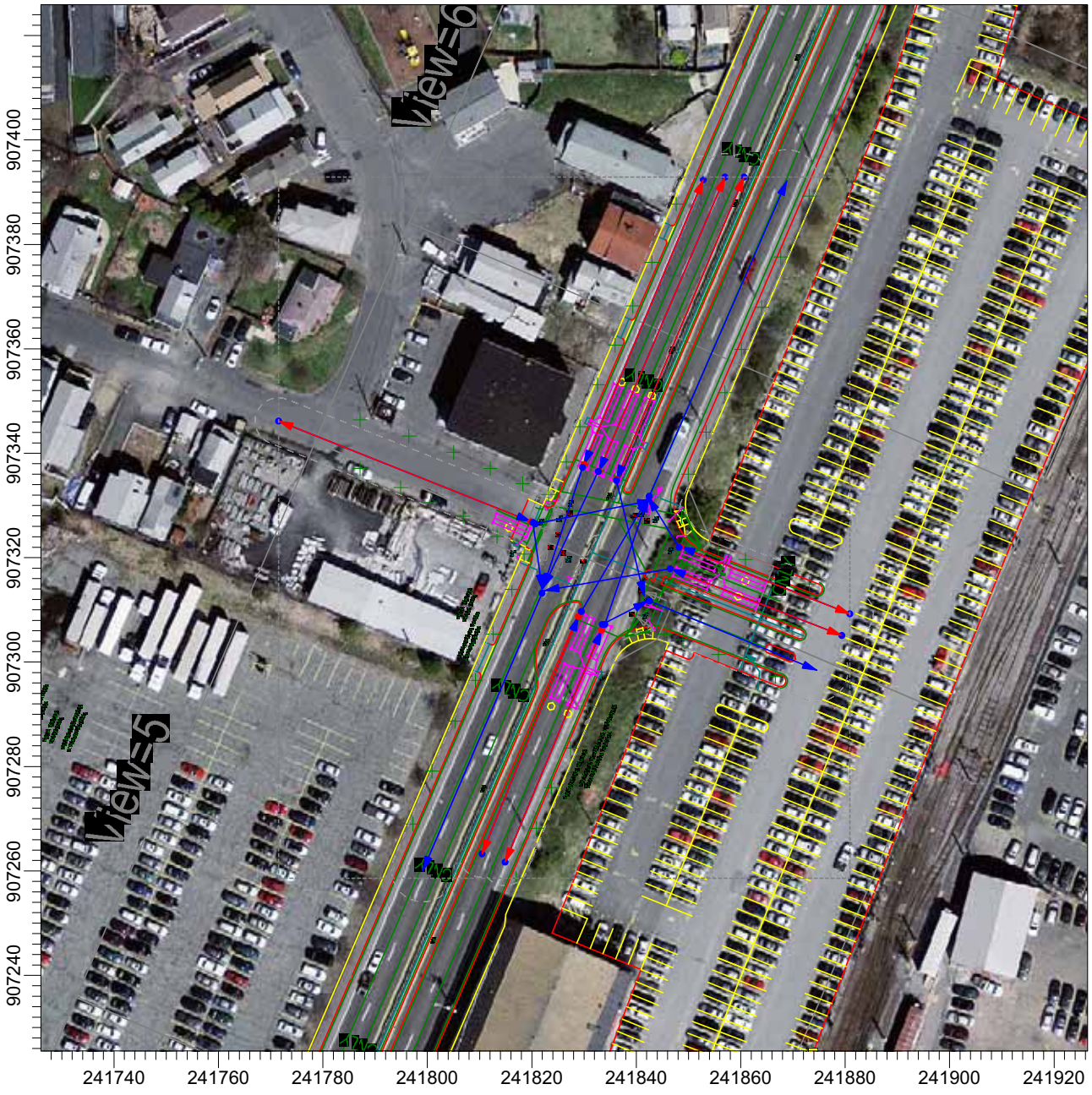
MBTA South Garage
CAL3QHC Intersection "Hotspot" Modeling Analysis



COMMENTS: Figure 4-4 Route 1A and Revere Street Intersection	MODEL: **CAL3QHC**	POLLUTANT: **CO**	COMPANY NAME: **Epsilon Associates, Inc.**	
			MODELER: **Vincent R. Tino, CCM**	Epsilon ASSOCIATES INC.
	LINKS: **38**	RECEPTORS: **60**		
	SCALE: 1:1,144 0 0.03 m		DATE: **7/10/2009**	PROJECT / PLOT NO.: **2679**

PROJECT TITLE:

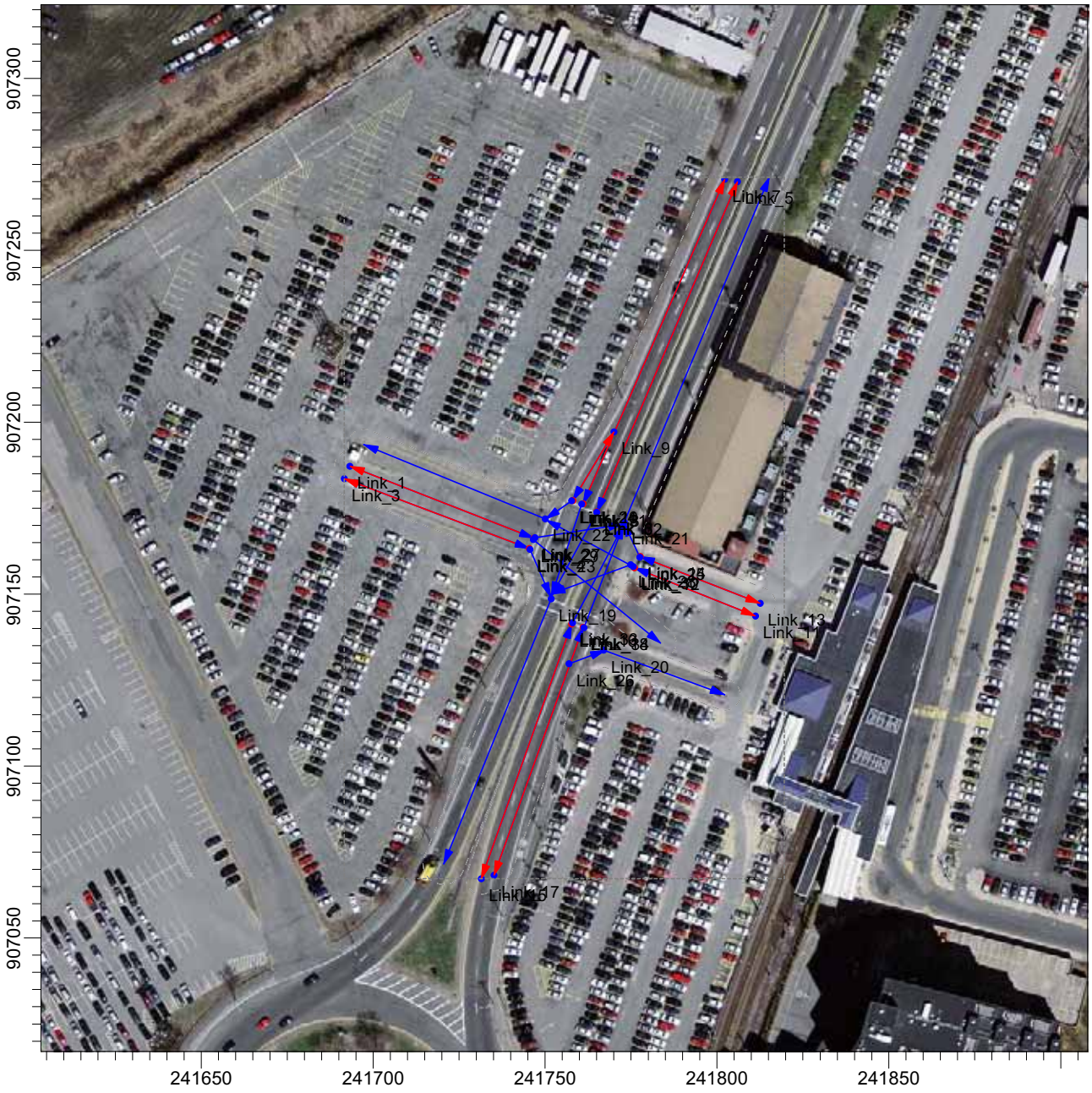
MBTA South Garage
CAL3QHC Intersection "Hotspot" Modeling Analysis



COMMENTS: Figure 4-5 Route 1A and Shawmut Street Intersection Build/Build w/Mitigation	MODEL: **CAL3QHC**	POLLUTANT: **CO**	COMPANY NAME: **Epsilon Associates, Inc.**	
			MODELER: **Vincent R. Tino, CCM**	Epsilon ASSOCIATES INC.
	LINKS: **29**	RECEPTORS: **47**		
	SCALE: 1:1,223 0 0.03 m		DATE: **7/10/2009**	PROJECT / PLOT NO.: **2679**

PROJECT TITLE:

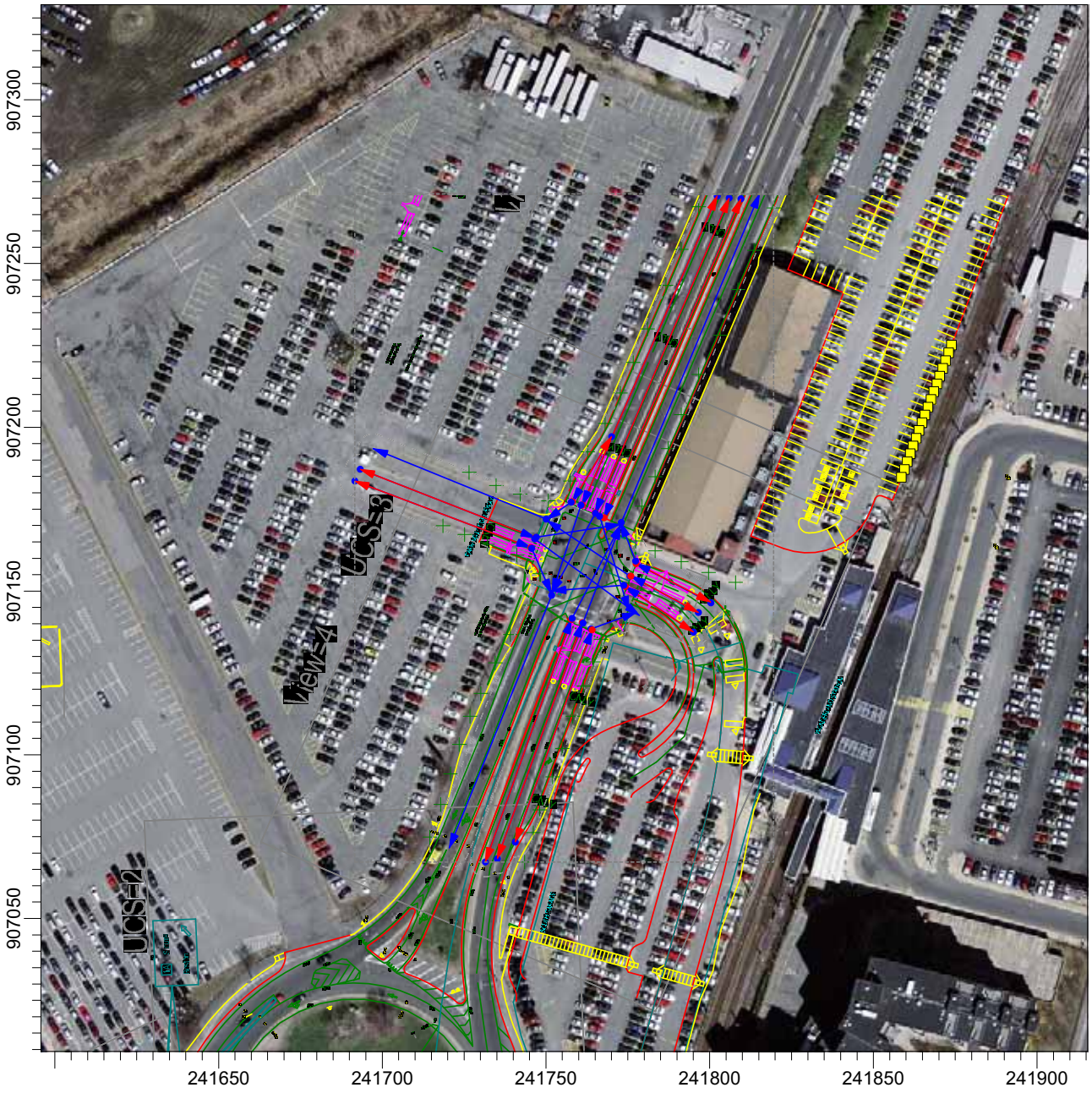
MBTA South Garage
CAL3QHC Intersection "Hotspot" Modeling Analysis



COMMENTS: Figure 4-6 Route 1A and Wonderland Park And Station Entries	MODEL: **CAL3QHC**	POLLUTANT: **CO**	COMPANY NAME: **Epsilon Associates, Inc.**	
			MODELER: **Vincent R. Tino, CCM**	Epsilon ASSOCIATES INC.
	LINKS: **34**	RECEPTORS: **57**		
	SCALE: 1:1,858 0 — 0.05 m		DATE: **7/10/2009**	PROJECT / PLOT NO.: **2679**

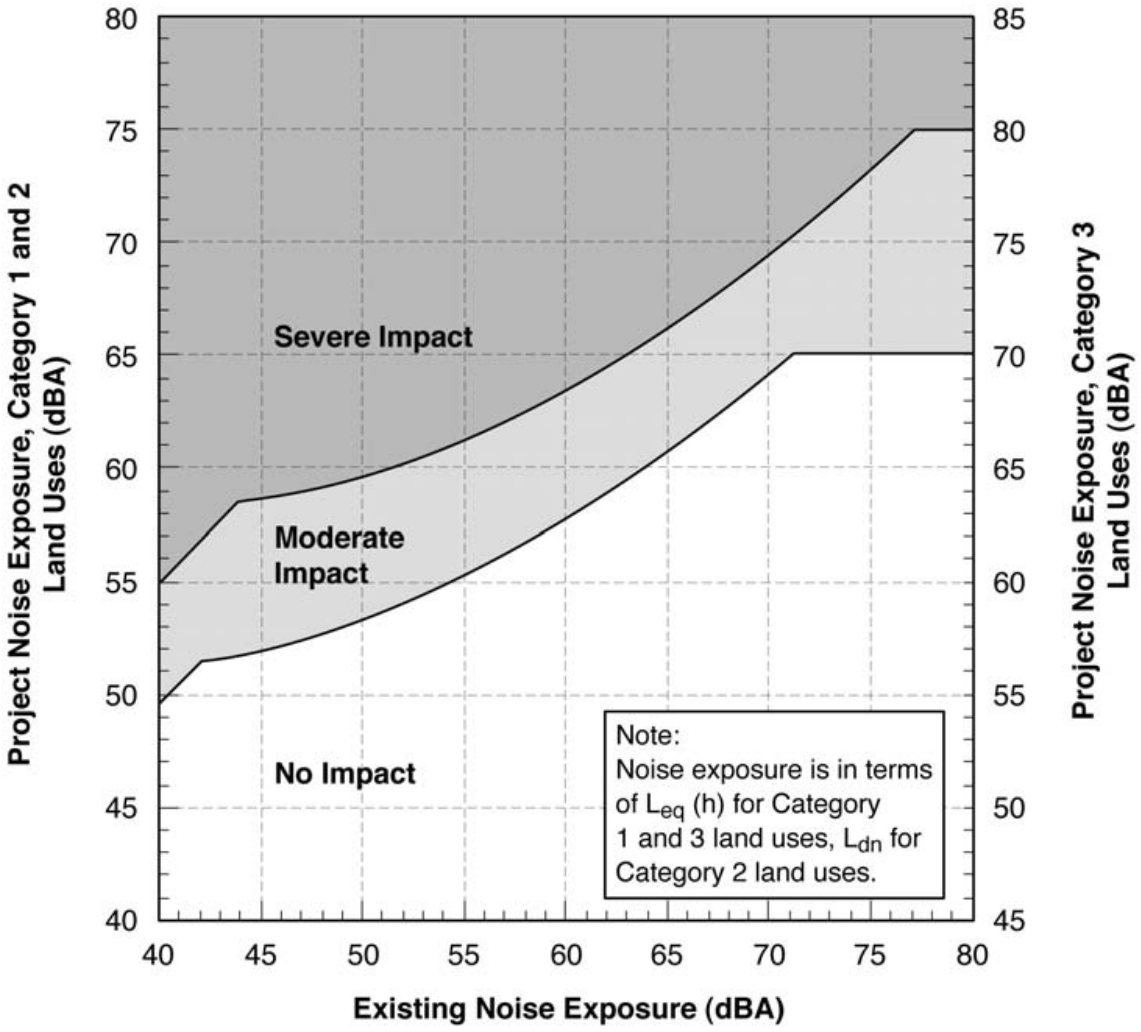
PROJECT TITLE:

MBTA South Garage
CAL3QHC Intersection "Hotspot" Modeling Analysis



COMMENTS: Figure 4-7 Route 1A and Wonderland Park/Garage Entries (Mitigated) Intersection	MODEL: **CAL3QHC**	POLLUTANT: **CO**	COMPANY NAME: **Epsilon Associates, Inc.**
			MODELER: **Vincent R. Tino, CCM**
	LINKS: **40**	RECEPTORS: **50**	
	SCALE: 1:1,951 0 0.05 m		DATE: **7/10/2009**
			PROJECT / PLOT NO.: **2679**

Figure 4-8 FTA Noise Impact Criteria for Transit Projects



Source: FTA-VA-90-1003-06, Figure 3-1

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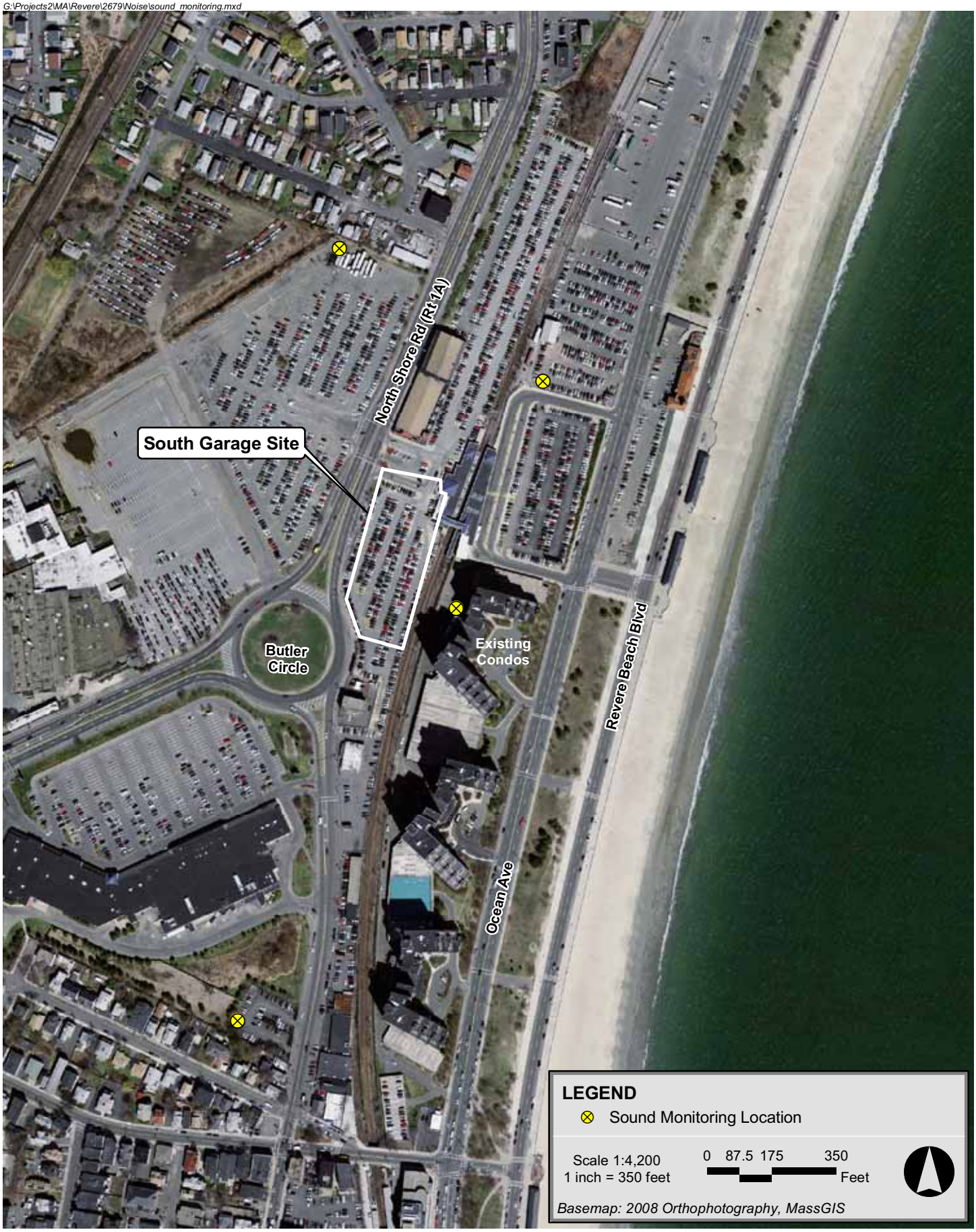
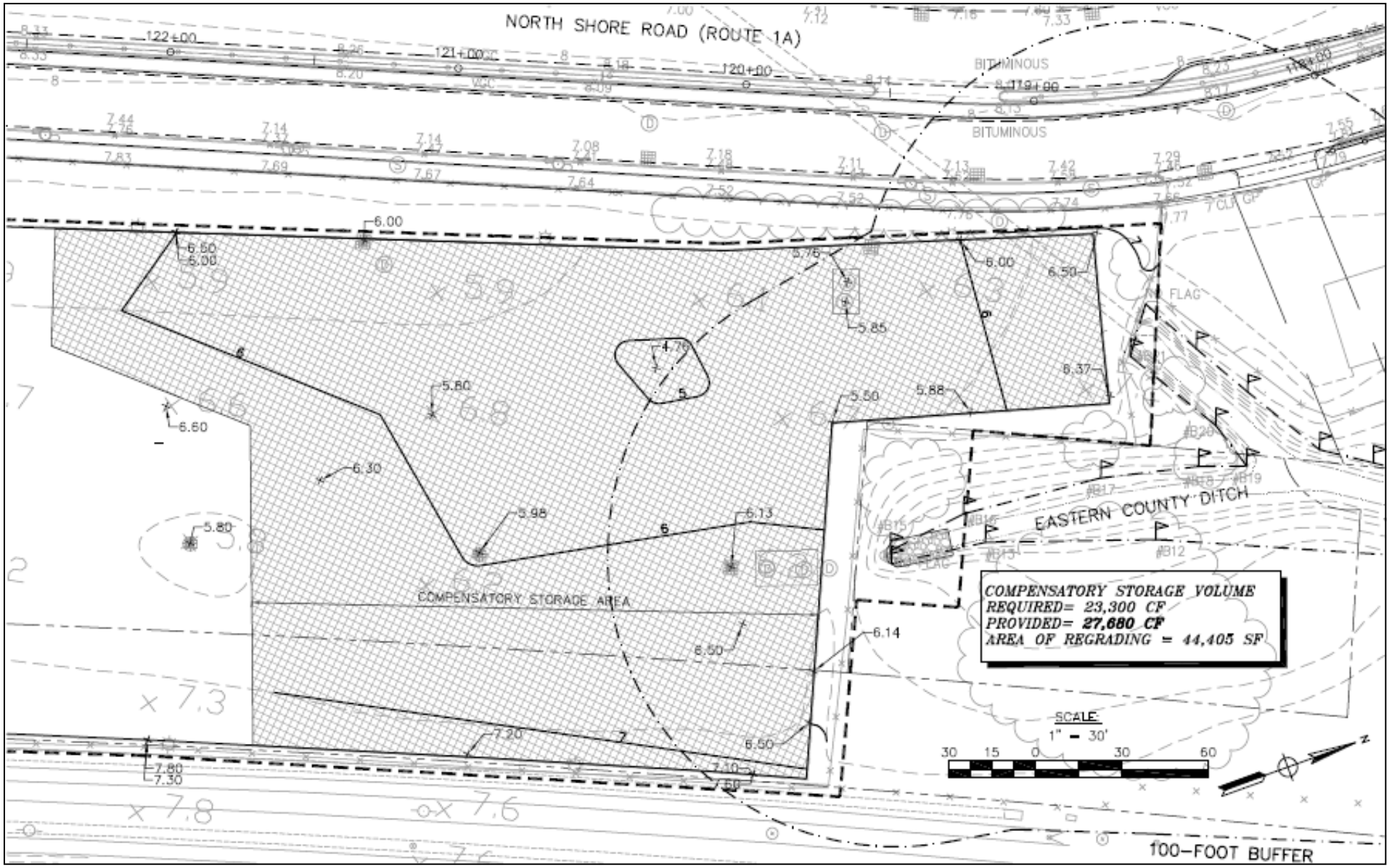


South Garage Project Revere, MA

Epsilon Associates, Inc.

Figure 4-9
Sound Monitoring Locations

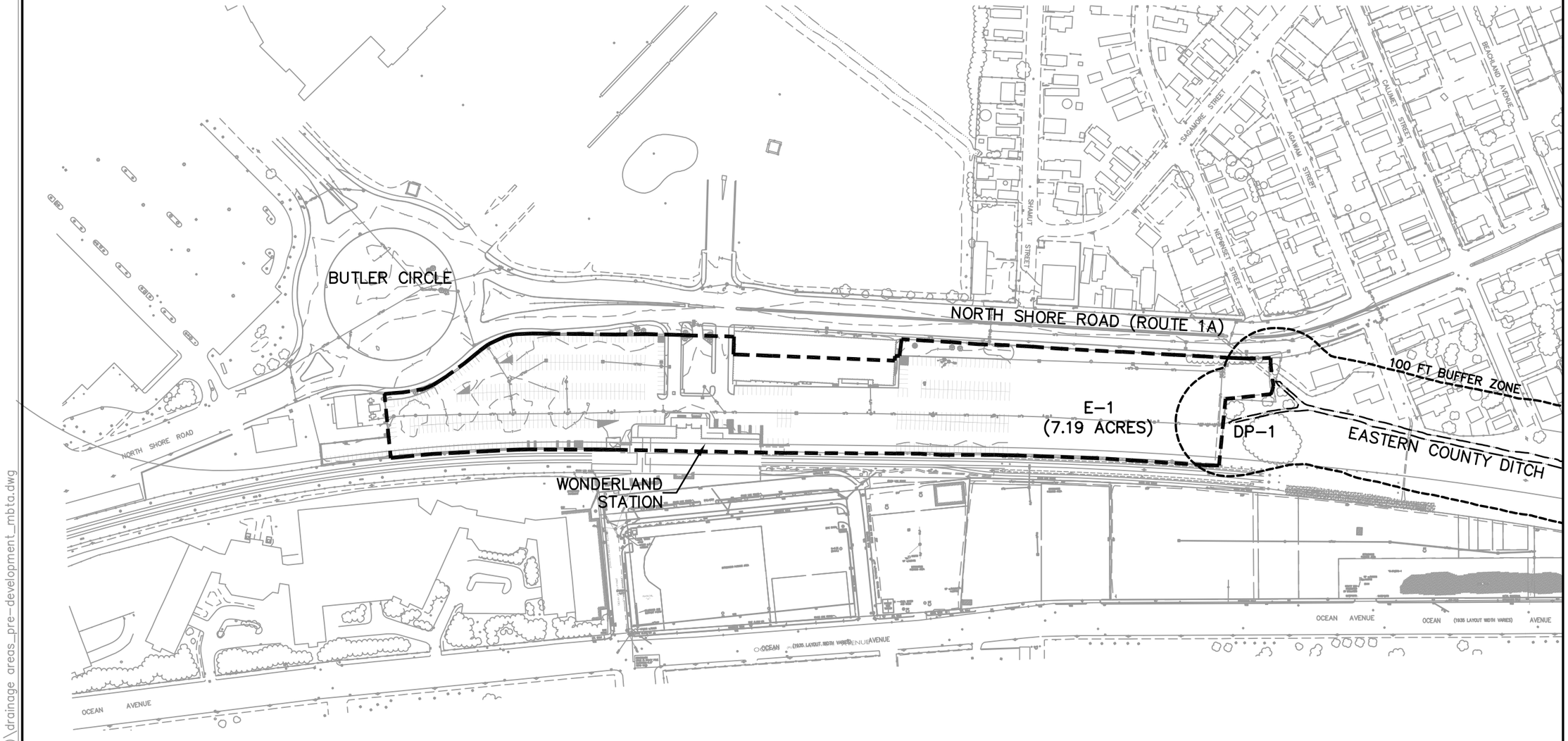


MBTA South Garage Revere, Massachusetts

Figure 4-10

Compensatory Storage Area Grading Plan

4/8/2009 5:44 PM



SCALE:
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PRE-DEVELOPMENT DRAINAGE MAP
SOUTH GARAGE AT WONDERLAND STATION
REVERE, MA

PREPARED FOR:
EUROVEST DEVELOPMENT, INC.
233 LEWIS WHARF, BOSTON, MA

PROJECT #	7030.2
FILE:	PRE-DEV_MBTA.DWG
SCALE:	1" = 200'
DATE:	4-08-09
PROJECT MGR:	GRB
SURVEYOR:	
DRAFTED BY:	BMD
CHECKED BY:	GRB

Figure 4-11

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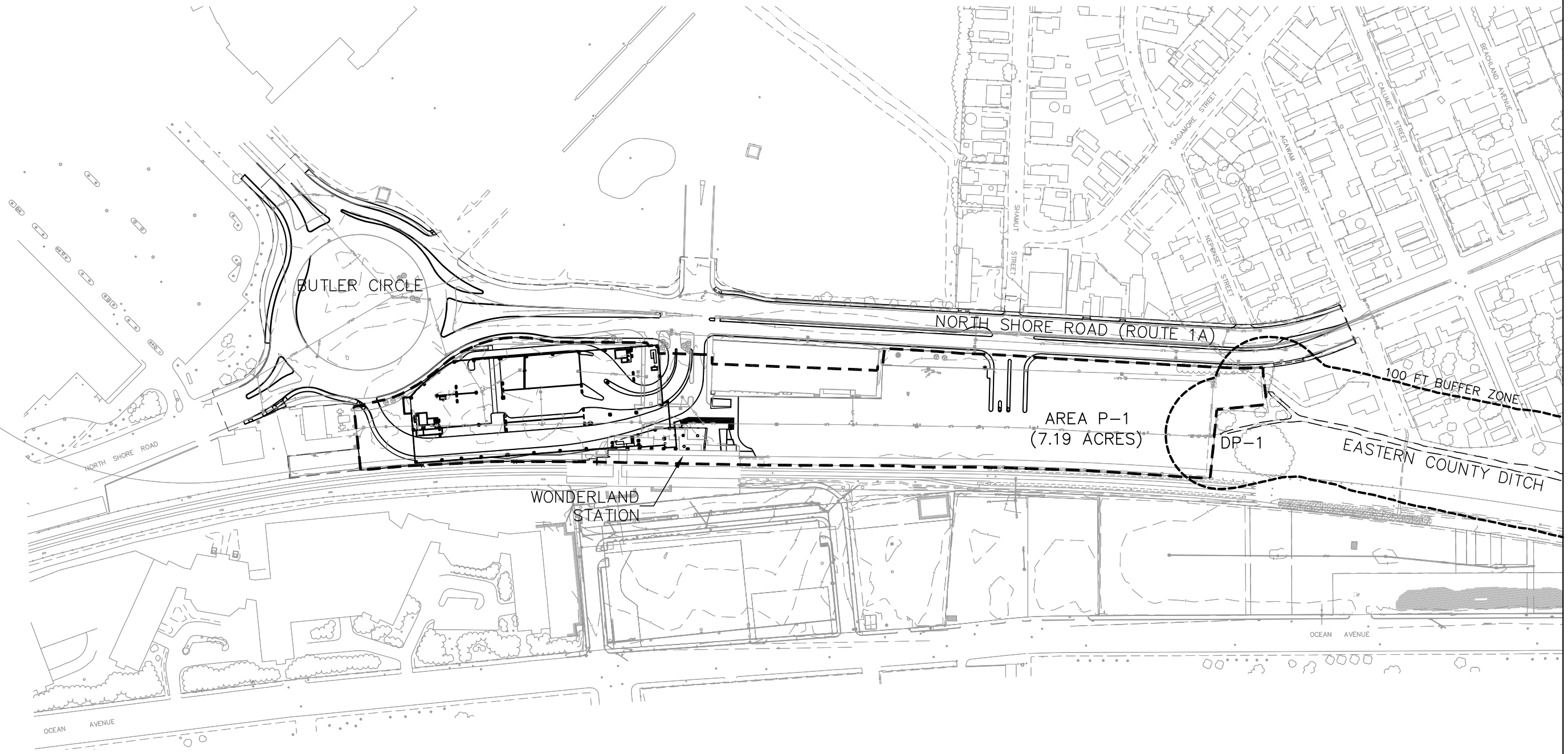

SCALE:

1" = 200'

200 100 0 200 400

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POST-DEVELOPMENT DRAINAGE MAP
SOUTH GARAGE AT WONDERLAND STATION
REVERE, MA

PREPARED FOR:
EUROVEST DEVELOPMENT, INC.
233 LEWIS WHARF, BOSTON, MA

PROJECT #	7030.1
FILE:	Post_Dev_MBTA.DWG
SCALE:	1" = 200'
DATE:	4-8-09
PROJECT MGR:	GRB
SURVEYOR:	
DRAFTED BY:	BMD
CHECKED BY:	GRB

Figure 4-12

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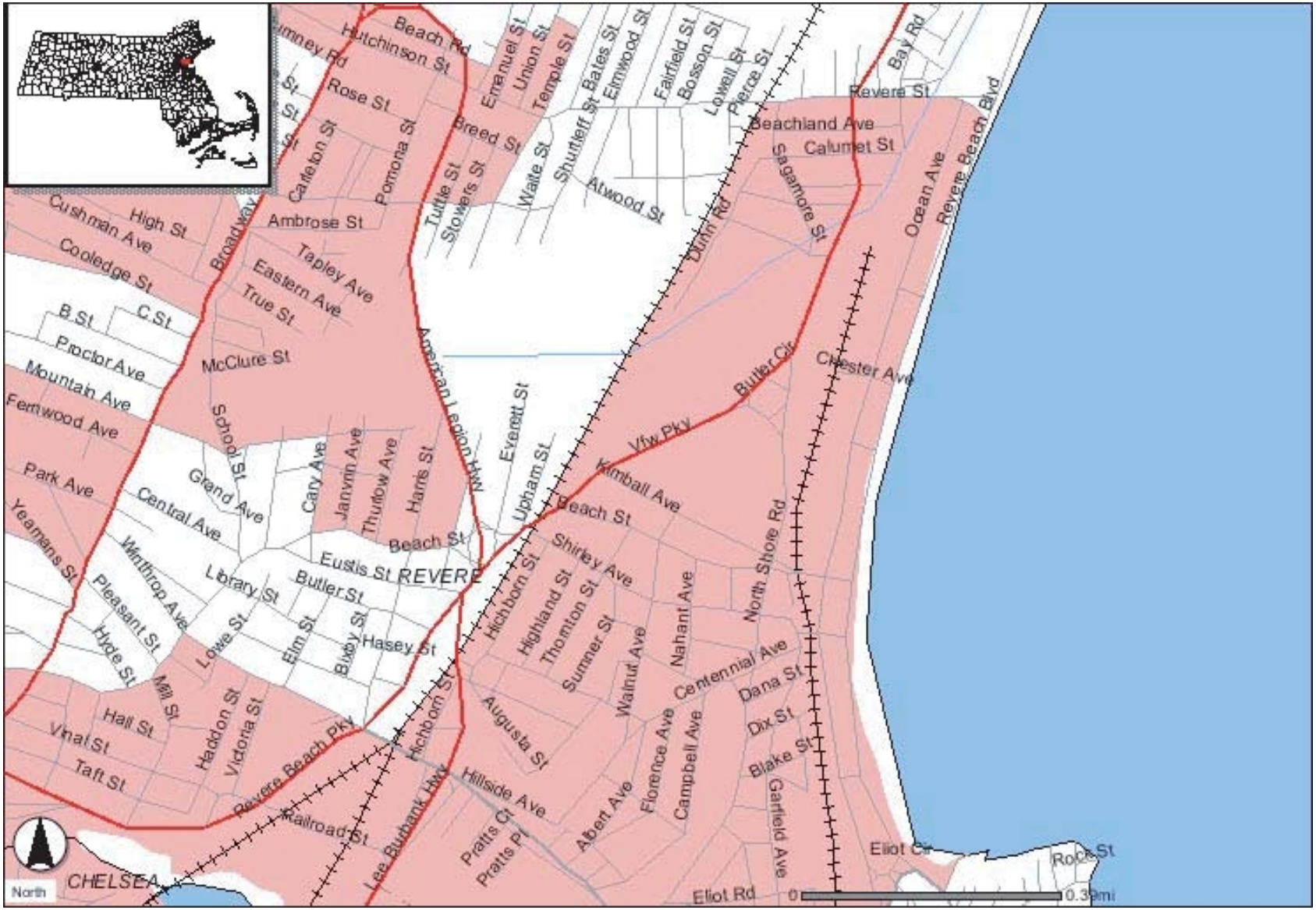
MBTA South Garage at Wonderland Station, Revere, Massachusetts

Epsilon Associates Inc.

Figure 4-13
National Historic Resources



MBTA South Garage Revere, Massachusetts

Figure 4-14

Environmental Justice Area (EOEA Definition)

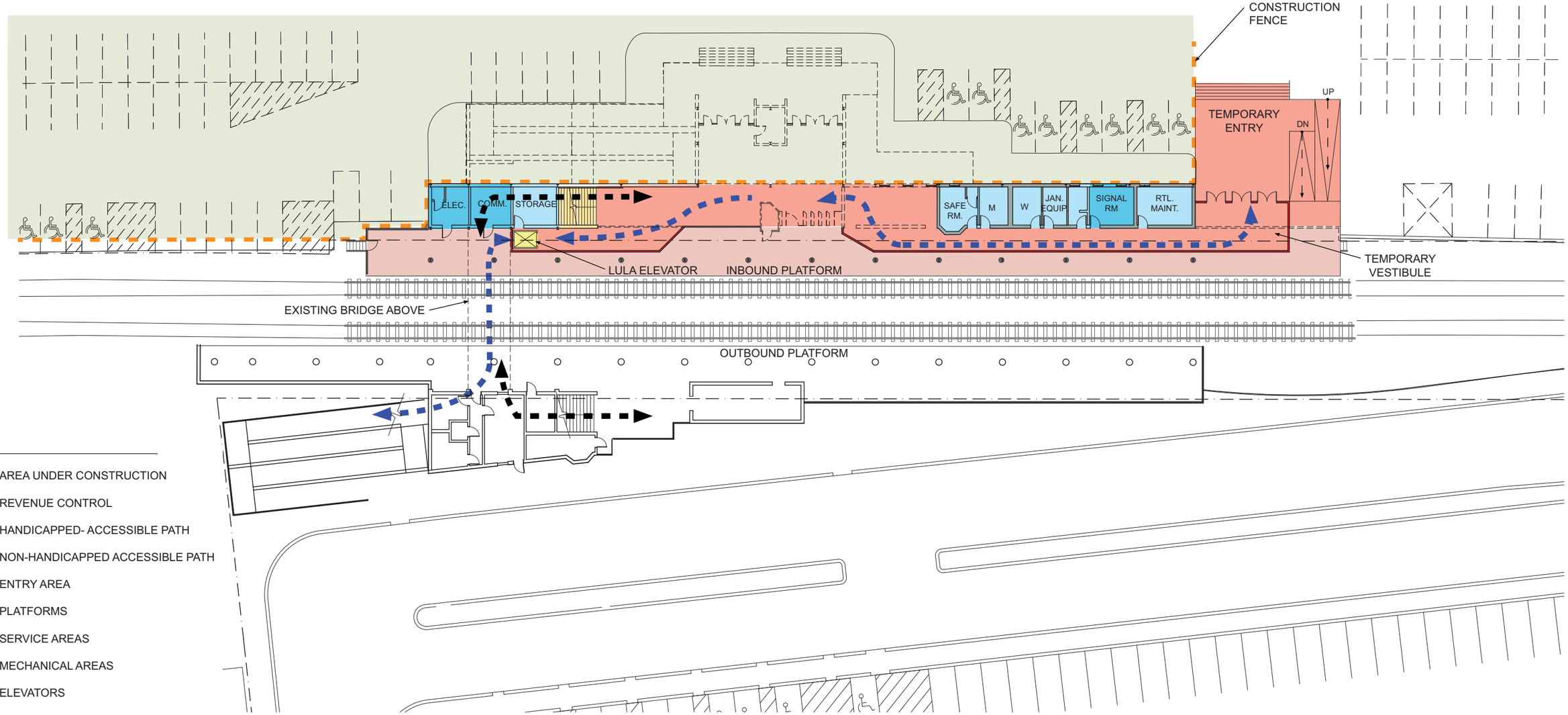


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Figure 4-15 Construction-Period Access to Wonderland Station

MBTA South Garage

0 8' 16' 32'

N

EUROVEST DEVELOPMENT